SMITH CORONA

PARTS MANUAL

5F SERIES
QUIET PRINT SYSTEM
ELECTRONIC TYPEWRITERS AND WORD PROCESSORS

XD 5900 (5FEJ)
WP 1100 (5FEK)
XD 7900 (5FEM)
PWP 1400 (5FEN)
PWP 2400 (5FER)
PWP 3600 (5FES)
PWP 3800 (5FEL)
WP 48D (5FDJ)
PWP 58D (5FDL)
PWP 3700 (5FHF)

SD 780 (5FCJ)
WP 135 (5FCK)
SD 880 (5FCM)
PWP 145 (5FCN)
PWP 3500 (5FEQ)
PWP 365 (5FCP)
PWP D350 (5FCL)
PWP 4000 (5FDK)
PWP 78D (5FDM)
PWP 3900 (5FWK)

IQ Intelligently™ Quiet

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PREFACE

This Parts Manual lists and illustrates parts and electronic components necessary for the maintenance of the following Smith Corona 5F Series Version 2 typewriters with QPS (Quiet Print System). These Models include:

24 Character LCD Models (without Disk Drive)

Model Name	Model Prefix	Jacket Colors
XD 5900	5FEJ	Silver Ash/Gray
SD 780	5FCJ	Silver Fog/Gray

40 Character LCD Models (without Disk Drive)

Model Name	Model Prefix	Jacket Colors
WP 1100	5FEK	Silver Ash/Gray
WP 135	5FCK	Silver Fog/Gray
WP 48D	5FDJ	Silver Ash/Gray
XD 7900	5FEM	Silver Ash/Gray
SD 880	5FCM	Silver Fog/Gray

8 Line LCD Models (with Disk Drive)

PWP 1400	5FEN	Silver Ash/Gray
PWP 2400	5FER	Silver Ash/Gray
PWP 145	5FCN	Silver Fog/Gray
PWP 58D	5FDL	Silver Ash/Gray

16 Line LCD Models(with Disk Drive)

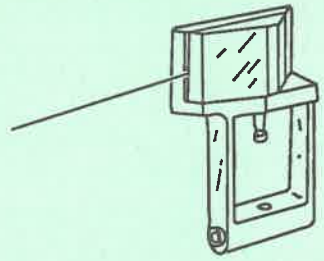
PWP 3600	5FES	Silver Ash/Gray
PWP 3500	5FEQ	Silver Ash/Gray
PWP 365	5FCP	Silver Fog/Gray
PWP 78D	5FDM	Silver Ash/Gray

Monitor Models (with Disk Drive)

PWP 3800	5FEL	Silver Ash/Gray
PWP D350	5FCL	Silver Ash/Gray
PWP 4000	5FDK	Silver Ash/Gray

PWP 3900	5FWK	Silver Ash/Gray
PWP 3700	5FHF	Silver Ash/Gray

Machines with QPS can be identified by the new design, larger Hammer:



Unique International parts are listed separately on each page where applicable.

A Reference Number is used on parts illustrations, and a Component Number is used for each Component on the Control PC Board diagrams. The number is listed numerically in the parts listing beneath the illustration or diagram, and refers directly to the part number.

When an illustrated part has variations in appearance, color, voltage, etc., the reference number appears more than once in the "REF" or "COMPONENT" column. Use extreme care in selecting parts in these areas.

If the part number is known, the page on which it is listed can readily be found by reference to the numerical parts listing at the end of the Manual.

Parts Ordering Instructions: State the correct part number on all parts orders. State additional information if asked for. It is not necessary to state the part name unless the part number is not known. Do not order by reference numbers.

PC Board Repair: Smith Corona encourages PC Board repair by qualified technicians. If, however, after trying to repair a PC Board, the Board still does not work properly, return the Board to Smith Corona National Service Stores for warranty or repair exchange.

Important: Smith Corona does not replace or exchange damaged PC Boards (in or out of warranty).

Boards will be returned as irreparable and no credits or exchanges issued when:

- There are missing components;
- There are damaged or lifted traces;
- There are solder burns;
- There is any other Board damage which makes the Board irreparable.

Smith Corona reserves the right to discontinue parts at any time and/or to furnish substitutes.

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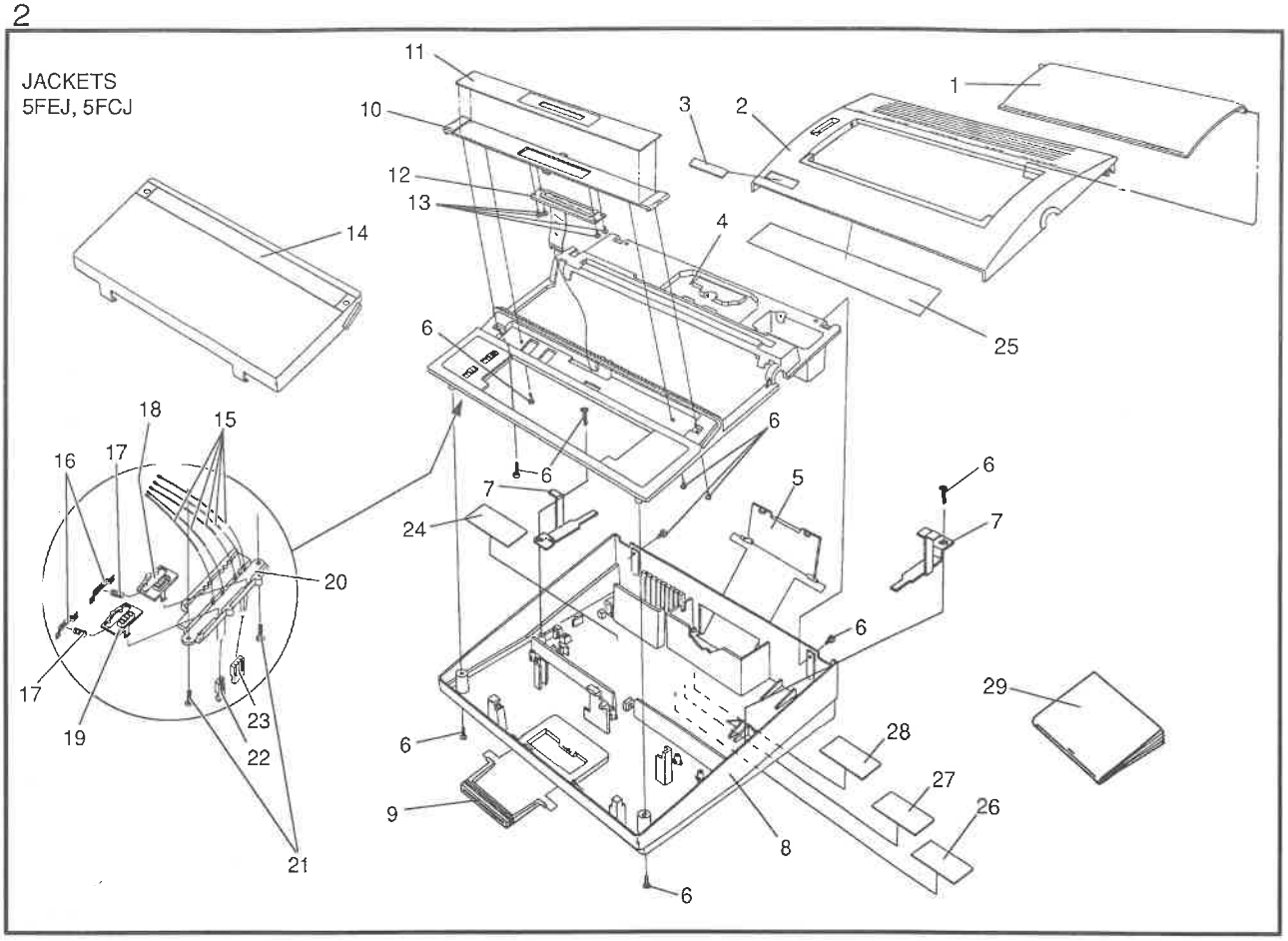
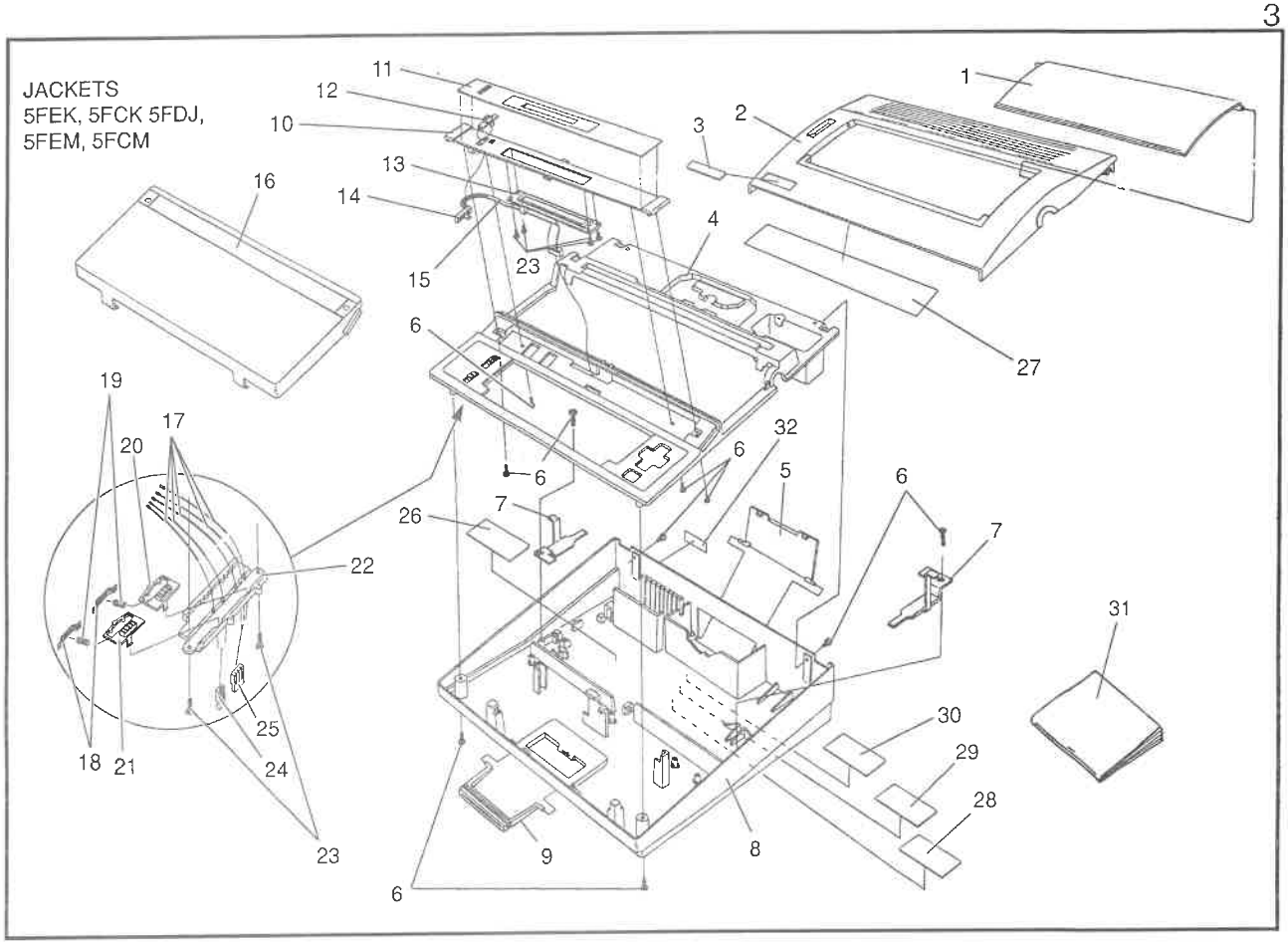


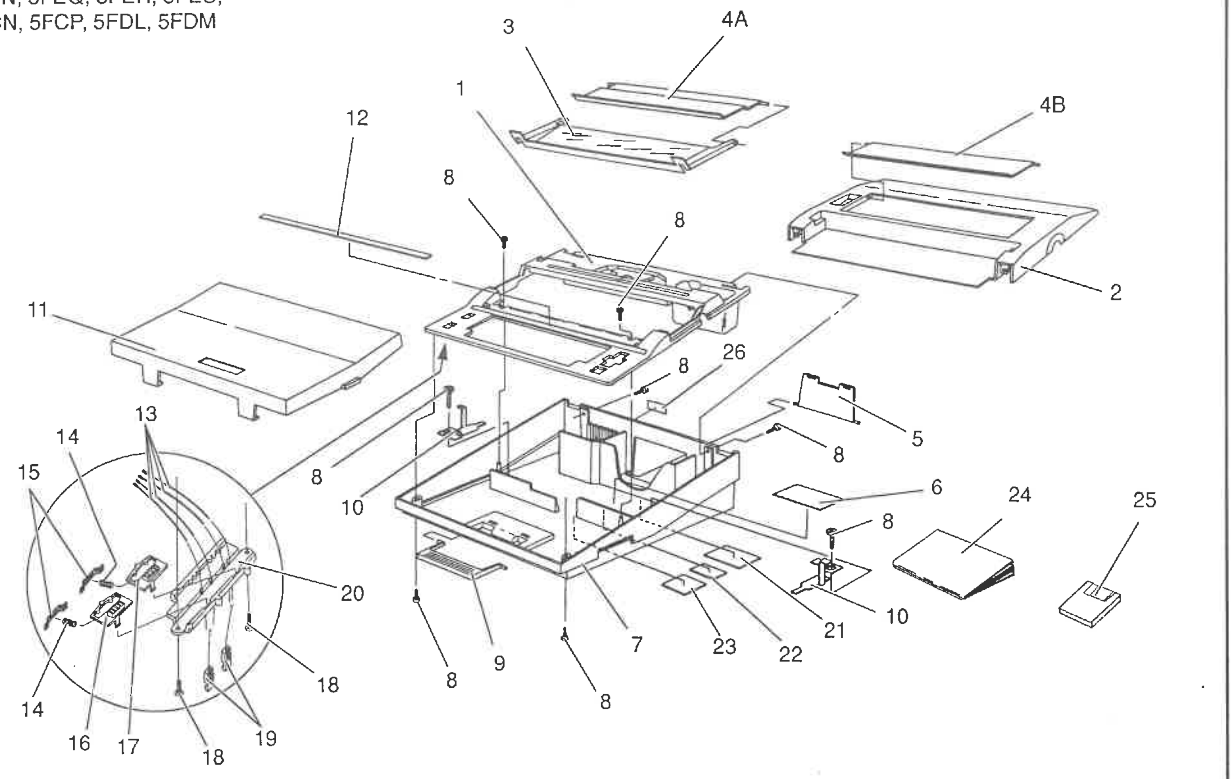
REF	PART NUMBER	PART NAME	QTY
1	792441	Paper Support, Silver Fog, 5FCJ	1
1	792442	Paper Support, Silver Ash, 5FEJ	1
2	793210	Deck, Silver Ash, w/Ref 3, XD 5900	1
2	793211	Deck, Silver Fog, w/Ref 3, SD 780	1
3	729572	Nameplate	1
4	793151	Mask Assembly, Accent Gray	1
5	791721	Cord Storage Door, Silver Fog, 5FCJ	1
5	791723	Cord Storage Door, Silver Ash, 5FEJ	1
6	747258	Screw	10
7	770829	Isolation Foot Retainer	2
8	780557	Casing Base Assembly, Silver Fog, w/Ref 5 & 9, 5FCJ	1
8	780558	Casing Base Assembly, Silver Ash, w/Ref 5 & 9, 5FEJ	1
9	768150	Handle, Carrying Case, Silver Fog, 5FCJ	1
9	768153	Handle, Carrying Case, Silver Ash, 5FEJ	1
10	783160	Filler, Accent Gray	1
11	793188	Overlay	1
12	783890	LCD, 24 Character	1
13	780424	Screw	4
14	783090	Keyboard Cover, Silver Fog, 5FCJ	1
14	783093	Keyboard Cover, Silver Ash, 5FEJ	1
15	776575	Switch Lead Assembly	5
16	776601	Sliding Contact	2
17	776599	Compression Spring	2
18	792312	Upper Switch Actuator	1
19	792322	Lower Switch Actuator	1
20	792303	Switch Plate	1
21	770672	Screw	2
22	736901	Connector, 2 Position	1
23	792300	Connector, 3 Position	1
24	794811	Warning Label, Four Language	1
25	794812	Packing/Unpacking Label	1
26	795000	FCC Label	1
27	772118	Patent Numbers Label	1
		Electric Rating Labels	
28	774458	Electric Rating Label, USA	1
28	774461	Electric Rating Label, Canada	1
		Owner's Manuals	
29	798288	Owner's Manual, 5FEJ, 5FCJ, USA	1
29	798289	Owner's Manual, 5FEJ, 5FCJ, Canada (English)	1
29	798290	Owner's Manual, 5FEJ, 5FCJ, Canada (French)	1



REF	PART NUMBER	PART NAME	QTY
1	792441	Paper Support, Silver Fog, 5FCK, 5FCM	1
1	792442	Paper Support, Silver Ash, 5FEK, 5FEM, 5FDJ	1
2	793215	Deck, Silver Ash, w/Ref 3, WP 1100	1
2	793217	Deck, Silver Fog, w/Ref 3, WP 135	1
2	793218	Deck, Silver Ash, w/Ref 3, WP 48D	1
3	729572	Nameplate	1
4	793152	Mask Assembly, Accent Gray	1
5	791721	Cord Storage Door, Silver Fog, 5FCK, 5FCM	1
5	791723	Cord Storage Door, Silver Ash, 5FEK, 5FEM, 5FDJ	1
6	747258	Screw	10
7	770829	Isolation Foot Retainer	2
8	780557	Casing Base Assembly, Silver Fog, w/Ref 5 & 9, 5FCK, 5FCM	1
8	780558	Casing Base Assembly, Silver Ash, w/Ref 5 & 9, 5FEK, 5FEM, 5FDJ	1
9	768150	Handle, Carrying Case, Silver Fog, 5FCK, 5FCM	1
9	768153	Handle, Carrying Case, Silver Ash, 5FEK, 5FEM, 5FDJ	1
10	783170	Filler, Accent Gray	1
11	793181	Overlay	1
12	783222	LCD Contrast Slider	1
13	783893	LCD, 40 Character	1
14	783576	Potentiometer	1
15	784130	LCD Cable Assembly, w/Ref 14	1
16	783090	Keyboard Cover, Silver Fog, 5FCK, 5FCM	1
16	783093	Keyboard Cover, Silver Ash, 5FEK, 5FEM, 5FDJ	1
17	776575	Switch Lead Assembly	5
18	776601	Sliding Contact	2
19	776599	Compression Spring	2
20	792312	Upper Switch Actuator	1
21	792322	Lower Switch Actuator	1
22	792303	Switch Plate	1
23	770672	Screw	6
24	736901	Connector, 2 Position	1
25	792300	Connector, 3 Position	1
26	794811	Warning Label, Four Language	1
27	794812	Packing/Unpacking Label	1
28	795000	FCC Label	1
29	772118	Patent Numbers Label	1
		Electric Rating Labels	
30	774458	Electric Rating Label, USA	1
30	774461	Electric Rating Label, Canada	1
30	774487	Electric Rating Label, Sp/Am, Chile	1
30	795235	Electric Rating Label, UK	1
30	795238	Electric Rating Label, Ger., Hol., France, Spain, Switz., Italy	1
30	795242	Electric Rating Label, S. Africa	1
30	795246	Electric Rating Label, Australia	1

REF	PART NUMBER	PART NAME	QTY
		Owner's Manuals	
31	798291	Owner's Manual, 5FEK, 5FCK, 5FDK, USA	1
31	798292	Owner's Manual, 5FEM, 5FCM, Canada (English)	1
31	798293	Owner's Manual, 5FEM, 5FCM, Canada (French)	1
31	798294	Owner's Manual, 5FEM, Sp/Am, Chile	1
31	798295	Owner's Manual, 5FEM, UK, Aust., S. Africa	1
31	798297	Owner's Manual, 5FEM, France, Switz.	1
31	798298	Owner's Manual, 5FEM, Italy	1
31	798299	Owner's Manual, 5FEM, Ger., Switz.	1
31	798300	Owner's Manual, 5FEM, Holland	1
31	798301	Owner's Manual, 5FEM, Spain	1
		Unique International Parts	
1	792444	Paper Support, Silver Ash, 5FEM, UK, Aust.	1
1	792445	Paper Support, Silver Ash, 5FCM, UK	1
2	793216	Deck, Silver Ash, w/Ref 3, XD 7900, UK, Aust. only	1
2	793219	Deck, Silver Ash, w/Ref 3, XD 7900	1
2	793220	Deck, Silver Fog, w/Ref 3, SD 880	1
2	793222	Deck, Silver Fog, w/Ref 3, SD 880 UK, Aust. only	1
4	793153	Mask Assembly, Accent Gray, 5FEM, 5FCM, UK, Aust.	1
4	793157	Mask Assembly, Accent Gray, 5FEM, Ger., Hol., France, Spain, Switz., Italy	1
8	780559	Casing Base Assembly, Silver Ash, w/Ref 5 & 9, 5FEM, UK, Aust.	1
8	780560	Casing Base Assembly, Silver Ash, w/Ref 5 & 9, 5FEM, Sp/Am, Chile	1
8	780561	Casing Base Assembly, Silver Fog, w/Ref 5 & 9, 5FCM, UK	1
10	783174	Filler, Accent Gray, 5FEM, UK, Aust., S. Afr.	1
11	793182	Overlay, UK, Aust., S. Afr.	1
11	793183	Overlay, Germany	1
11	793184	Overlay, Spain	1
11	793185	Overlay, France	1
11	793186	Overlay, Hol., Switz., Italy	1
13	793035	LCD, 40 Character, Ger., Hol., France, Spain, Switz., Italy	1
26	794820	Warning Label, Ger., Hol., France, Spain, Switz., Italy	1
32	771445	Country of Origin Label, UK	1

JACKETS
5FEN, 5FEQ, 5FER, 5FES,
5FCN, 5FCP, 5FDL, 5FDM

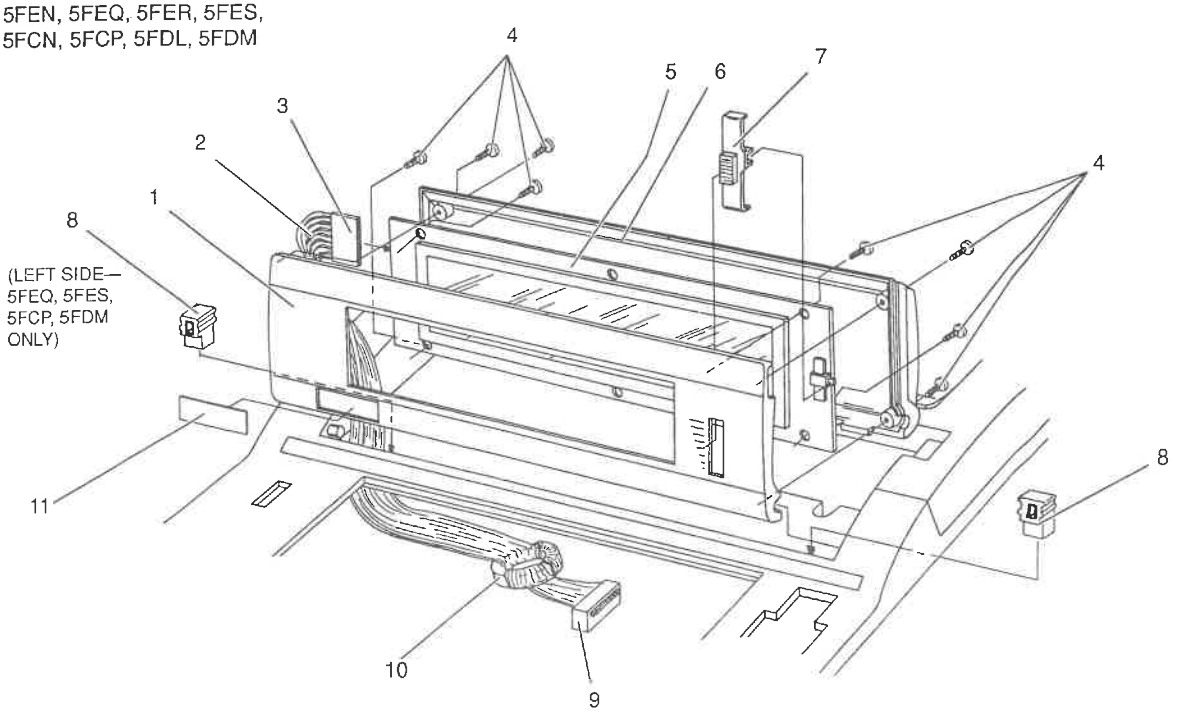


REF	PART NUMBER	PART NAME	QTY
1	790591	Mask, Accent Gray	1
2	793450	Deck, Silver Ash, 5FEQ, 5FES, 5FDM	1
2	793451	Deck, Silver Fog, 5FCP	1
2	793483	Deck, Silver Ash, 5FEN, 5FER, 5FDL	1
2	793484	Deck, Silver Fog, 5FCN	1
3	791643	Sound Shield, 5FEQ, 5FES, 5FCP, 5FDM	1
3	791648	Sound Shield, 5FER	1
4A	791653	Paper Support, Silver Ash, 5FEQ, 5FER, 5FES, 5FDM	1
4A	791656	Paper Support, Silver Fog, 5FCP	1
4B	792490	Paper Support, Silver Ash, 5FEN, 5FDL	1
4B	792491	Paper Support, Silver Fog, 5FCN	1
5	791721	Cord Storage Door, Silver Fog	1
5	791723	Cord Storage Door, Silver Ash	1
6	794811	Warning Label, 4 Language	1
7	797165	Casing Base, Silver Fog, w/Ref 5 & Ref 9, 5FCN, 5FCP	1
7	797167	Casing Base, Silver Ash, w/Ref 5 & Ref 9, 5FEN, 5FER, 5FES, 5FDL, 5FDM	1
8	747258	Screw	8
9	768150	Handle, Carrying Case, Silver Fog	1
9	768153	Handle, Carrying Case, Silver Ash	1
10	770322	Isolation Foot Retainer	2
11	790396	Keyboard Cover, Silver Fog	1
11	790397	Keyboard Cover, Silver Ash	1
12	791553	Overlay, 5FEN, 5FCN, 5FCP, 5FDL, 5FDM	1
12	791558	Overlay, 5FER, 5FES	1
13	776575	Switch Lead Assembly	4
14	776599	Compression Spring	2
15	776601	Sliding Contact	2
16	792322	Lower Switch Actuator	1
17	792312	Upper Switch Actuator	1
18	770672	Screw	2
19	736901	Connector, 2 Position	2
20	792303	Switch Plate	1
21	772118	Patent Numbers Label	1
22	795000	FCC Label	1

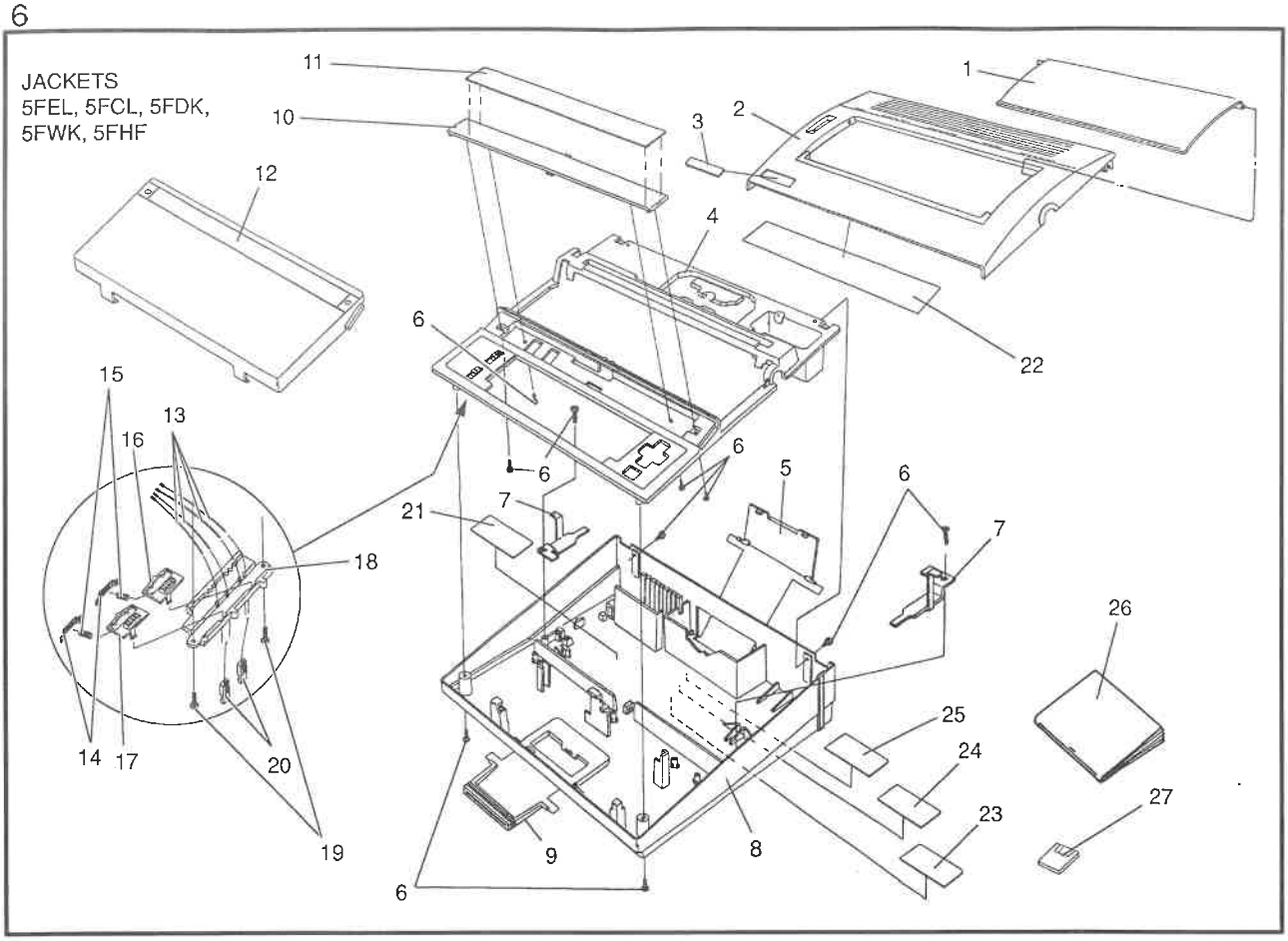
REF	PART NUMBER	PART NAME	QTY
		Electric Rating Labels	
23	774481	Electric Rating Label, USA	1
23	774461	Electric Rating Label, Canada	1
23	774483	Electric Rating Label, Sp/Am	1
23	795248	Electric Rating Label, 5FER, UK, Aust.	1
23	795249	Electric Rating Label, 5FES, UK, Aust.	1
23	795243	Electric Rating Label, France, Ger. Hol., Spain	1
		Owner's Manuals	
24	798307	Owner's Manual, 5FER, 5FES, 5FCN, 5FCP, 5FDL, 5FDM, USA	1
24	798308	Owner's Manual, 5FEN, 5FER, 5FCN, Canada (English)	1
24	798309	Owner's Manual, 5FEN, 5FER, 5FCN, Canada (French)	1
24	798251	Owner's Manual, 5FES, Canada (English)	1
24	798252	Owner's Manual, 5FES, Canada (French)	1
24	798318	Owner's Manual, 5FER, 5FES, UK Australia	1
24	798254	Owner's Manual, 5FEQ, Sp/Am	1
24	798257	Owner's Manual, 5FEQ, France	1
24	798256	Owner's Manual, 5FEQ, Germany	1
24	798247	Owner's Manual, 5FEQ, Holland	1
24	798259	Owner's Manual, 5FEQ, Spain	1
		Utility Disks	
25	769662	Utility Disk, 5FES, USA	1
25	769666	Utility Disk, 5FCN, 5FDL, USA	1
25	769667	Utility Disk, 5FER, USA	1
25	769677	Utility Disk, 5FCP, 5FDM, USA	1
25	769686	Utility Disk, 5FEN, Canada (English)	1
25	769687	Utility Disk, 5FEN, Canada (French)	1
25	769689	Utility Disk, 5FCN, Canada (English)	1
25	769690	Utility Disk, 5FCN, Canada (French)	1
25	769675	Utility Disk, 5FER, Canada (English)	1
25	769683	Utility Disk, 5FER, Canada (French)	1
25	769678	Utility Disk, 5FES, Canada (English)	1
25	769684	Utility Disk, 5FES, Canada (French)	1
25	769676	Utility Disk, 5FER, UK, Australia	1
25	769679	Utility Disk, 5FES, UK, Australia	1
25	769668	Utility Disk, 5FEQ, Sp/Am	1
25	769669	Utility Disk, 5FEQ, France	1
25	769670	Utility Disk, 5FEQ, Germany	1
25	769671	Utility Disk, 5FEQ, Holland	1
25	769672	Utility Disk, 5FEQ, Spain	1

Unique International Parts are listed on Page 5.

LCD ASSEMBLY
5FEN, 5FEQ, 5FER, 5FES,
5FCN, 5FCP, 5FDL, 5FDM

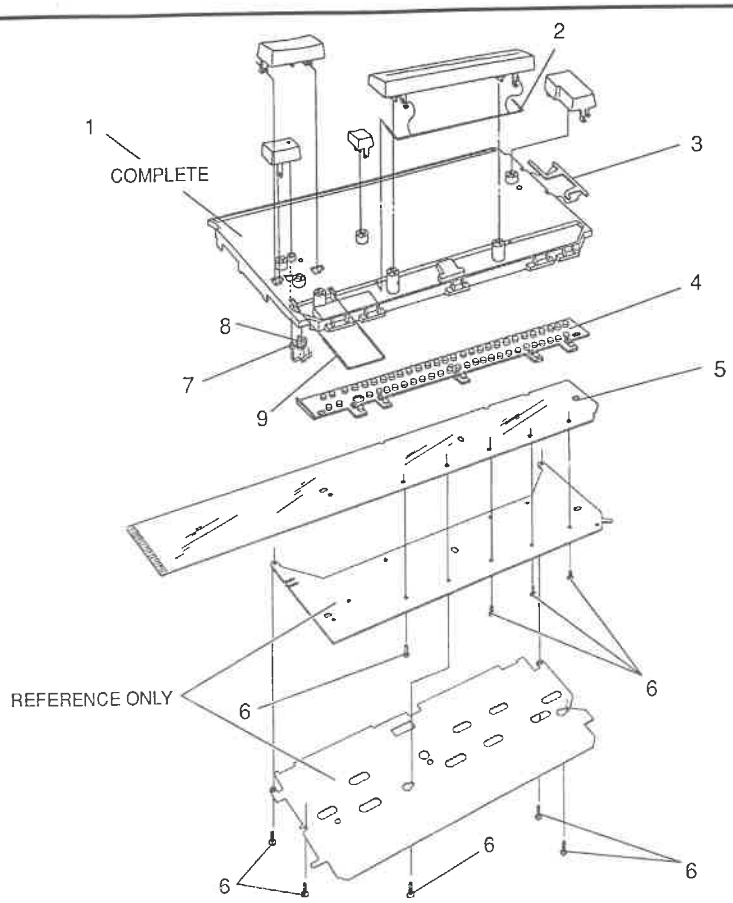


REF	PART NUMBER	PART NAME	QTY
	Unique International Jacketing Parts		
	Illustrated on Page 4.		
1	790590	Mask, Accent Gray, 5FEQ, 5FER, 5FES, UK, Aust., Sp/Am, France, Ger., Hol., Spain	1
2	793452	Deck, Silver Ash, 5FEQ, 5FES, UK, Aust., Sp/Am, France, Ger., Hol., Spain	1
2	793483	Deck, Silver Ash, 5FER, UK, Aust.	1
4A	791655	Paper Support, Silver Ash, 5FEQ, 5FER, 5FES, UK, Aust., Sp/Am, France, Ger., Hol., Spain	1
6	794820	Warning Label, France, Ger., Hol., Spain	1
7	797166	Casing Base, Silver Ash, w/Ref 5 & Ref 9, 5FER, 5FES, UK, Aust.	1
7	797168	Casing Base, Silver Ash, w/Ref 5 & Ref 9, 5FEQ, Sp/Am	1
7	797169	Casing Base, Silver Ash, w/Ref 5 & Ref 9, 5FEQ, France, Ger., Hol., Spain	1
12	791559	Overlay, 5FER, 5FES, UK, Aust.	1
12	791554	Overlay, 5FES, Sp/Am	1
12	791556	Overlay, 5FEQ, France	1
12	791551	Overlay, 5FEQ, Germany	1
12	791552	Overlay, 5FEQ, Holland	1
12	791557	Overlay, 5FEQ, Spain	1
26	771445	Country of Origin Label, UK	1
	LCD Assembly Parts		
	Illustrated Above		
1	792981	Upper LCD Housing, Silver Fog, PWP 145	1
1	792982	Upper LCD Housing, Silver Ash, PWP 58D	1
1	792984	Upper LCD Housing, Silver Ash, PWP 2400	1
1	792987	Upper LCD Housing, Silver Ash, PWP 3600	1
1	792989	Upper LCD Housing, Silver Fog, PWP 365	1
1	792990	Upper LCD Housing, Silver Ash, PWP 78D	1
2	791594	LCD Cable Assembly, w/Ref 3, Ref 9, & Ref 10	1
3	760804	Connector, 10 Position	1
4	770672	Self Tap Screw	8
5	790318	LCD, 480 x 64, 5FEN, 5FCN	1
5	790319	LCD, 480 x 64, 5FER, 5FDL	1
5	793342	LCD, 480 x 128, 5FEQ, 5FES, 5FCP, 5FDM	1
5	591165*	LCD, Reconditioned 793342	1
5	591166*	LCD, Reconditioned 790318	1
5	591167*	LCD, Reconditioned 790319	1
6	790381	Lower LCD Housing, Silver Fog, 5FCN	1
6	790383	Lower LCD Housing, Silver Ash, 5FEN, 5FER, 5FDL	1
6	793430	Lower LCD Housing, Silver Ash, 5FEQ, 5FES, 5FDM	1
6	793431	Lower LCD Housing, Silver Fog, 5FCP	1
7	790417	Contrast Slider Switch, Silver Fog, 5FCN	1
7	790418	Contrast Slider Switch, Silver Ash, 5FER, 5FDL	1
7	793500	Contrast Slider Switch, Silver Ash, 5FEQ, 5FES, 5FDM	1
7	793501	Contrast Slider Switch, Silver Fog, 5FCP	1
8	768308	LCD Housing Brake, 5FEN, 5FER, 5FCN, 5FDL	1
8	768308	LCD Housing Brake, 5FEQ, 5FES, 5FCP, 5FDM	2
9	782558	Connector, 10 Pin, Dual Row	1
10	782289	Toroid	1
11	900240	Nameplate	1
	*When available.		
	Unique International LCD Assembly Parts		
1	792980	Upper LCD Housing, Silver Ash, PWP 1400, Canada	1
1	792988	Upper LCD Housing, Silver Ash, PWP 3600, UK, Aust.	1
1	792991	Upper LCD Housing, Silver Ash, PWP 2400, UK, Aust.	1
1	792993	Upper LCD Housing, Silver Ash, PWP 3500, France, Ger., Hol., Spain	1
1	792994	Upper LCD Housing, Silver Ash, PWP 3500, Sp/Am	1
6	790384	Lower LCD Housing, Silver Ash, 5FER, UK, Aust.	1
6	793432	Lower LCD Housing, Silver Ash, 5FEQ, 5FES, UK, Aust., France, Ger. Hol., Spain	1



REF	PART NUMBER	PART NAME	QTY
1	792442	Paper Support, Silver Ash	1
2	792423	Deck, Silver Ash, PWP 3800	1
2	792424	Deck, Silver Ash, PWP D350	1
2	792425	Deck, Silver Ash, PWP 3900	1
2	792426	Deck, Silver Ash, PWP 4000	1
2	792427	Deck, Silver Ash, PWP 3700	1
3	729572	Nameplate	1
4	793159	Mask Assembly, Accent Gray	1
5	791723	Cord Storage Door, Silver Ash	1
6	747258	Screw	10
7	770829	Isolation Foot Retainer	2
8	797163	Casing Base Assembly, Silver Ash, w/Ref 5 & Ref 9	1
9	768153	Handle, Carrying Case, Silver Ash	1
10	783160	Filler, Accent Gray	1
11	793391	Overlay	1
12	783093	Keyboard Cover, Silver Ash	1
13	776575	Switch Lead Assembly	4
14	776601	Sliding Contact	2
15	776599	Compression Spring	2
16	792312	Upper Switch Actuator	1
17	792322	Lower Switch Actuator	1
18	792303	Switch Plate	1
19	770672	Screw	2
20	736901	Connector, 2 Position	2
21	794811	Warning Label, Four Language	1
22	794813	Packing/Unpacking Label	1
23	795000	FCC Label	1
24	772118	Patent Numbers Label	1
25	774481	Electric Rating Label	1
26	798307	Owner's Manual	1
27	769685	Utility Disk	1

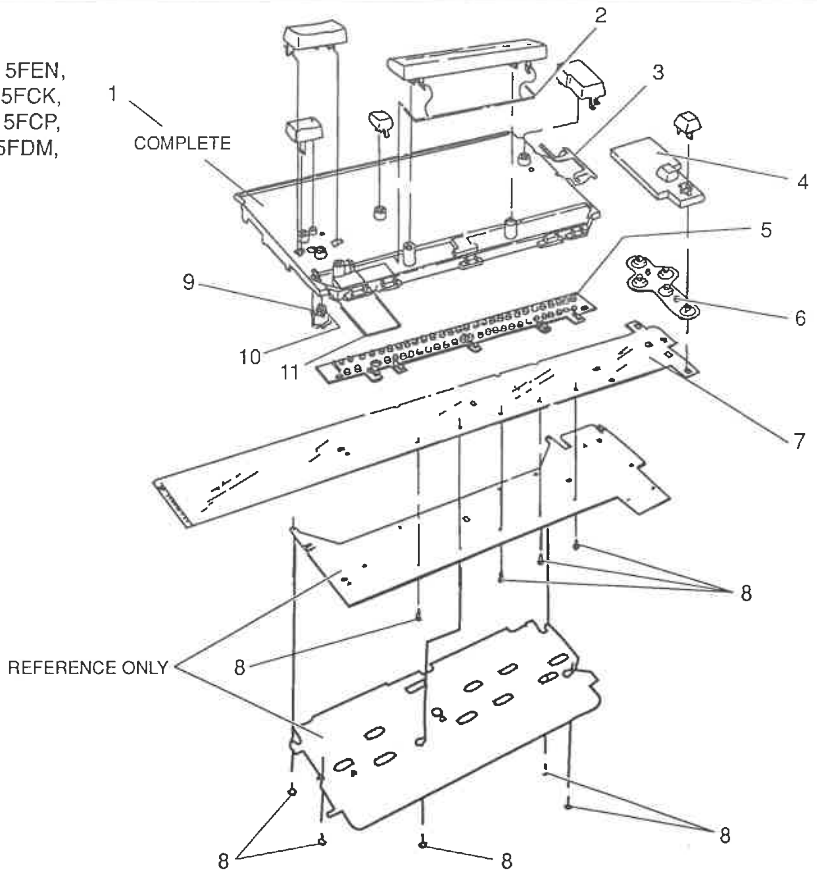
KEYBOARD
5FEJ, 5FCJ



REF	PART NUMBER	PART NAME	QTY
	24 Chracter LCD Models		
1	777938	Keyboard Complete, Silver Ash, 5FEJ, 5FCJ, USA	1
2	778281	Spacebar Bail	1
3	778815	Return Bail	1
4	778814	Molded Switches	1
5	778805	Flexible Circuit	1
6	778807	Self Tap Screw	13
7	778316	LED, Green	1
8	778347	LED Contact Washer	1
9	778282	Left Shift Bail	1

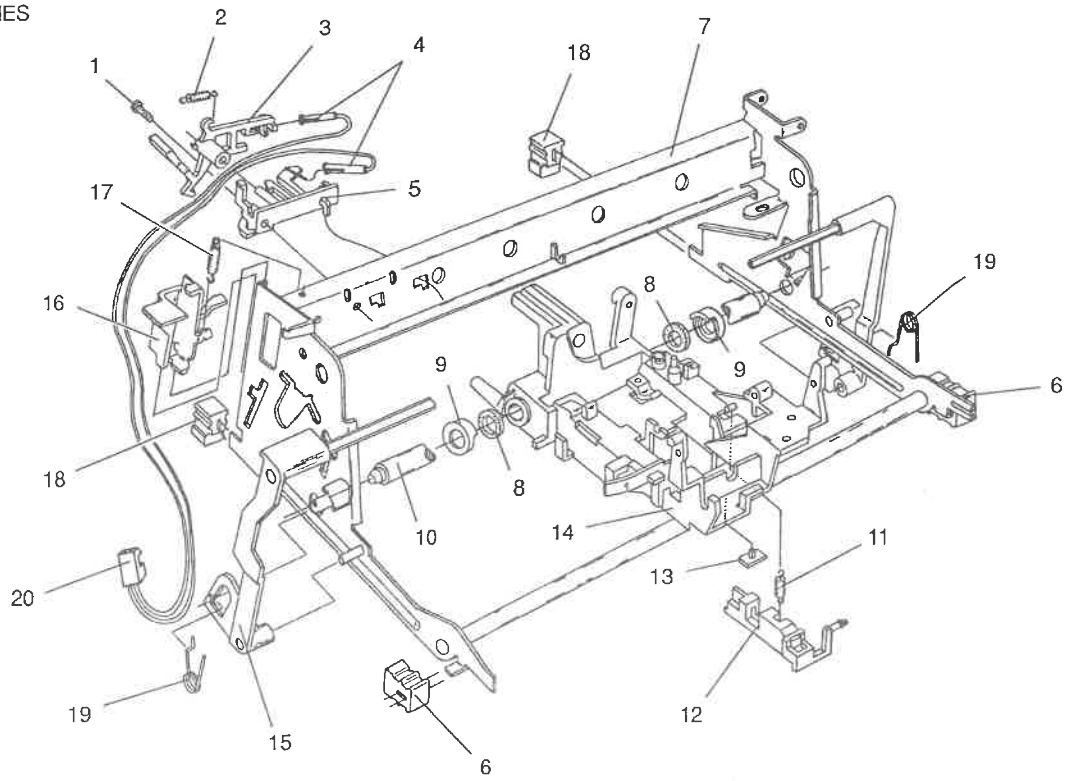
REF	PART NUMBER	PART NAME	QTY
	International Keyboard		
1	777939	Keyboard Complete, Silver Ash, 5FEJ, 5FCJ, Canada	

KEYBOARD
5FEK, 5FEL, 5FEM, 5FEN,
5FEQ, 5FER, 5FES, 5FCK,
5FCL, 5FCM, 5FCN, 5FCP,
5FDJ, 5FDK, 5FDL, 5FDM,
5FWK, 5FHF



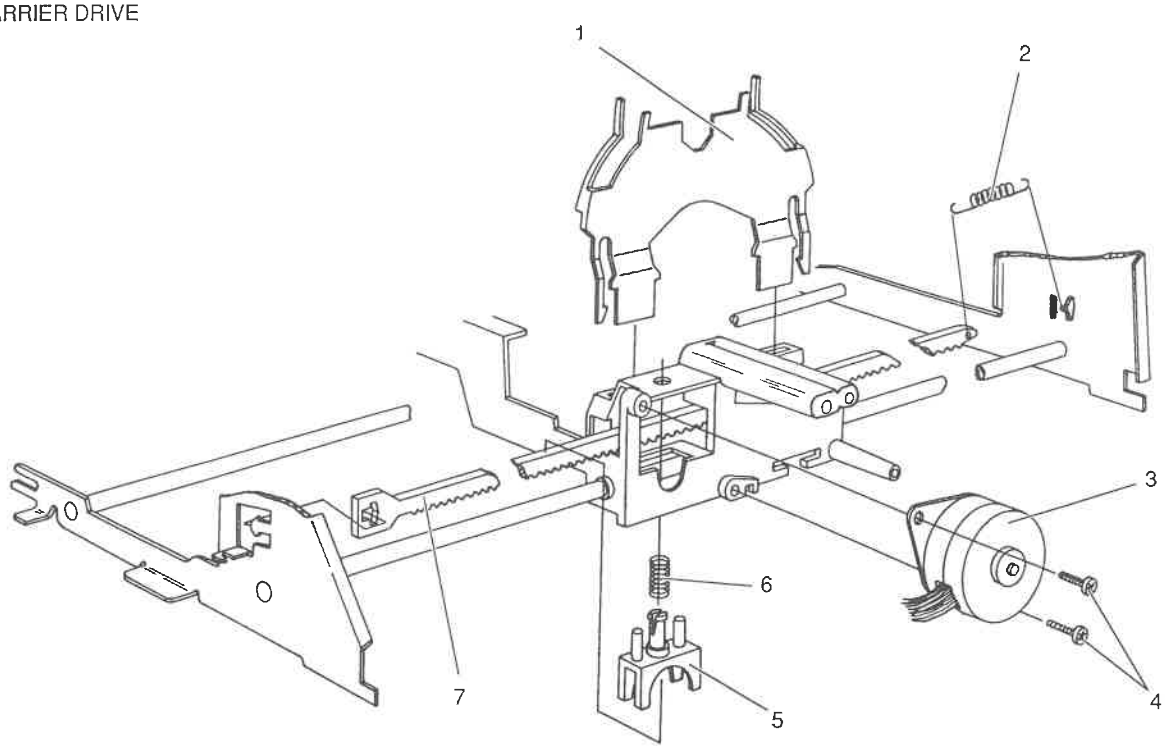
REF	PART NUMBER	PART NAME	QTY
		40 Character LCD Models	
1	779180	Keyboard Complete, Silver Ash, 5FEK, 5FCK, 5FDJ, USA	1
		8 Line LCD, 16 Line LCD, and Monitor Models	
1	779417	Keyboard Complete, Silver Ash, 5FEL, 5FER, 5FES, 5FCL, 5FCN, 5FCP, 5FDK, 5FDL, 5FDM, 5FWK, 5FHF, USA	1
2	778281	Spacebar Bail	1
3	778815	Return Bail	1
4	779060	Keypad Body	1
5	778814	Molded Switches	1
6	779061	Molded Switches, Keypad	1
7	779062	Flexible Circuit	1
8	778807	Self Tap Screw	13
9	778316	LED, Green	1
10	778347	LED Contact Washer	1
11	778282	Left Shift Bail	1
		International Keyboards	
		40 Character LCD Models	
1	779181	Keyboard Complete, Silver Ash, 5FEM, 5FCM, Canada	1
1	779182	Keyboard Complete, Silver Ash, 5FEM, Spanish American	1
1	779183	Keyboard Complete, Silver Ash, 5FEM, South Africa	1
1	779184	Keyboard Complete, Silver Ash, 5FEM, Germany	1
1	779185	Keyboard Complete, Silver Ash, 5FEM, Spain	1
1	779186	Keyboard Complete, Silver Ash, 5FEM, France	1
1	779187	Keyboard Complete, Silver Ash, 5FEM, Switzerland	1
1	779188	Keyboard Complete, Silver Ash, 5FEM, Italy	1
1	779189	Keyboard Complete, Silver Ash, 5FEM, Holland	1
1	779416	Keyboard Complete, Silver Ash, 5FEM, United Kingdom, Australia	1
		8 Line and 16 Line LCD Models	
1	779408	Keyboard Complete, Silver Ash, 5FEN, 5FER, 5FES, 5FCN, Canada	1
1	779410	Keyboard Complete, Silver Ash, 5FEQ, Holland	1
1	779411	Keyboard Complete, Silver Ash, 5FEQ, Germany	1
1	779412	Keyboard Complete, Silver Ash, 5FEQ, France	1
1	779413	Keyboard Complete, Silver Ash, 5FEQ, Spain	1
1	779414	Keyboard Complete, Silver Ash, 5FEQ, Spanish American	1
1	779426	Keyboard Complete, Silver Ash, 5FER, 5FES, United Kingdom, Australia	1

CARRIER MOLDING, RAILS, AND FRAMES



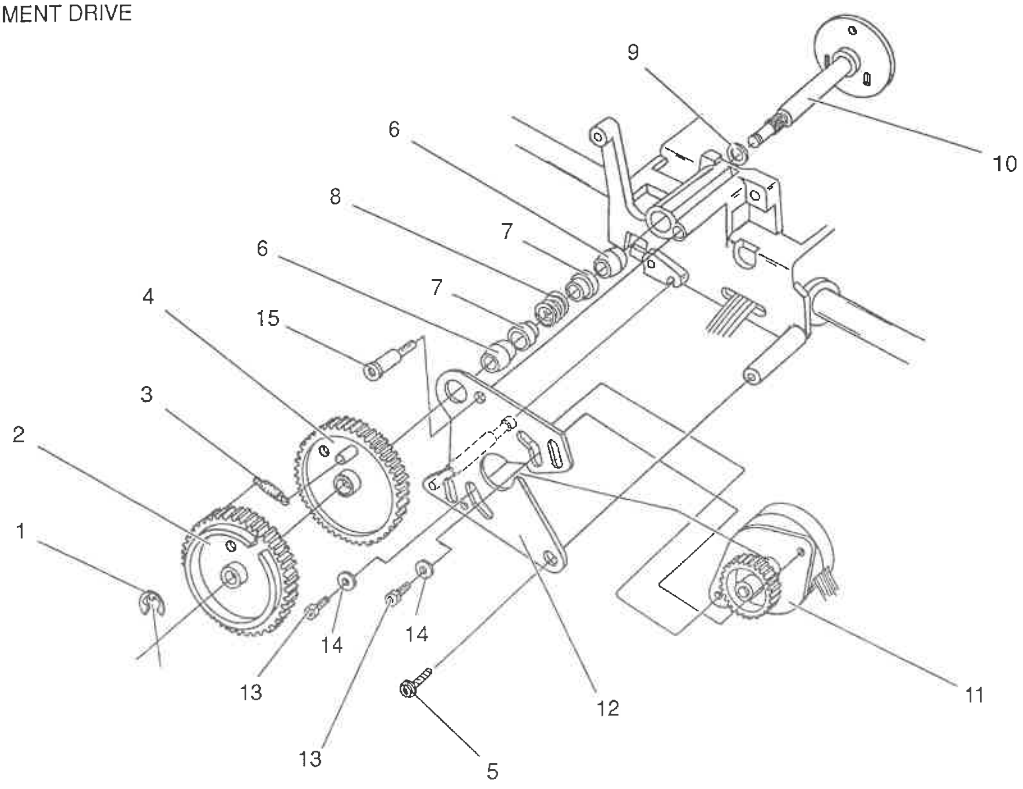
REF	PART NUMBER	PART NAME	QTY
1	783194	Self Tap Screw	1
2	133250	Spring	1
3	783190	Left End Switch Latch	1
4	775216	Left End Switch Assembly, w/Ref 20, 5FEL, 5FEN, 5FEQ, 5FER, 5FES, 5FCL, 5FCN, 5FCP, 5FDK, 5FDL, 5FDM, 5FWK, 5FHF	1
4	775217	Left End Switch Assembly, w/Ref 20, 5FEJ, 5FEK, 5FEM, 5FCJ, 5FCK, 5FCM, 5FDJ	1
5	783191	Left End Switch Bracket	1
6	797108	Foot, Front	2
7	796295	Frame Assembly Complete	1
8	740084	Wiper	2
9	740257	Wiper Retainer	2
10	783197	Rear Carrier Shaft	1
11	777012	Spring	1
12	776571	Carrier Restraint	1
13	780411	Slider	1
14	796269	Molded Carrier, w/Ref 13, 5FEJ, 5FEK, 5FEM, 5FCJ, 5FCK, 5FCM, 5FDJ	
14	796291	Molded Carrier, w/Ref 13, 5FEL, 5FEN, 5FEQ, 5FER, 5FES, 5FCL, 5FCN, 5FCP, 5FDK, 5FDL, 5FDM, 5FWK, 5FHF	
15	796906	Paper Bail Assembly (includes Arms, Bail, & Rollers)	1
16	796300	Actuator	1
17	771271	Spring	1
18	797107	Foot, Rear	2
19	791954	Paper Bail Spring	2
20	751057	Connector, 2 Pin	1

CARRIER DRIVE



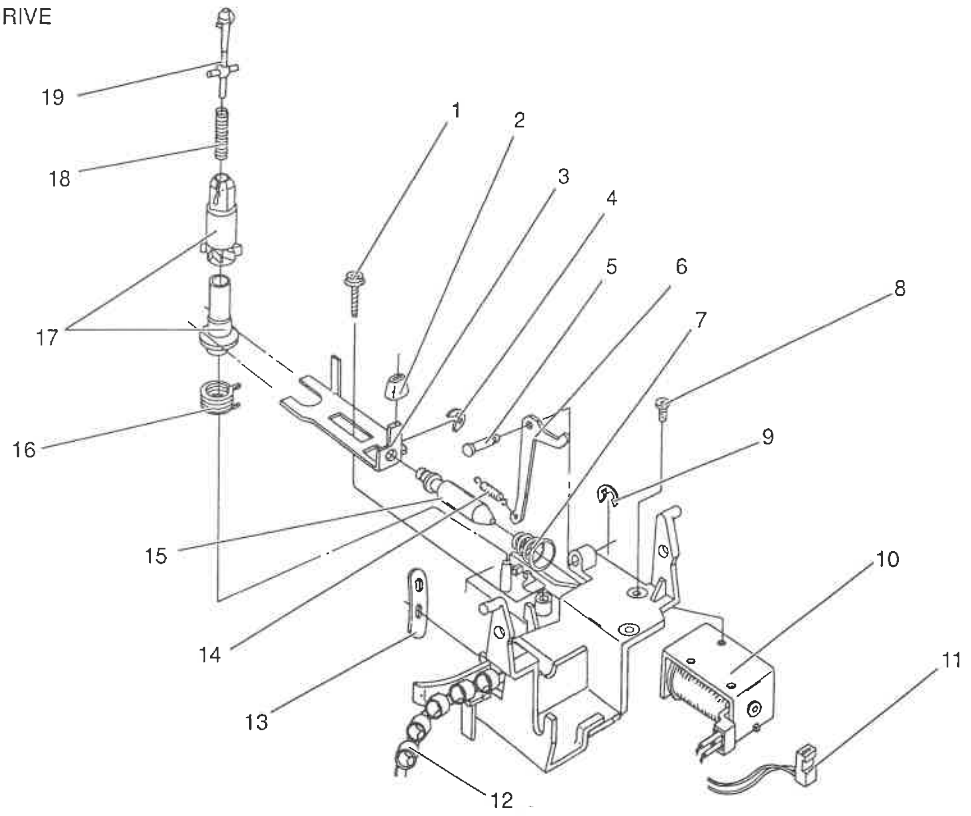
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	796267	Line Indicator	1	5	796266	Anti-Backlash Slider	1
2	783136	Spring	1	6	751719	Spring	1
3	770173	Carrier Motor Assembly	1	7	768669	Carrier Drive Rack	1
4	747258	Carrier Motor Screw	2				

ELEMENT DRIVE



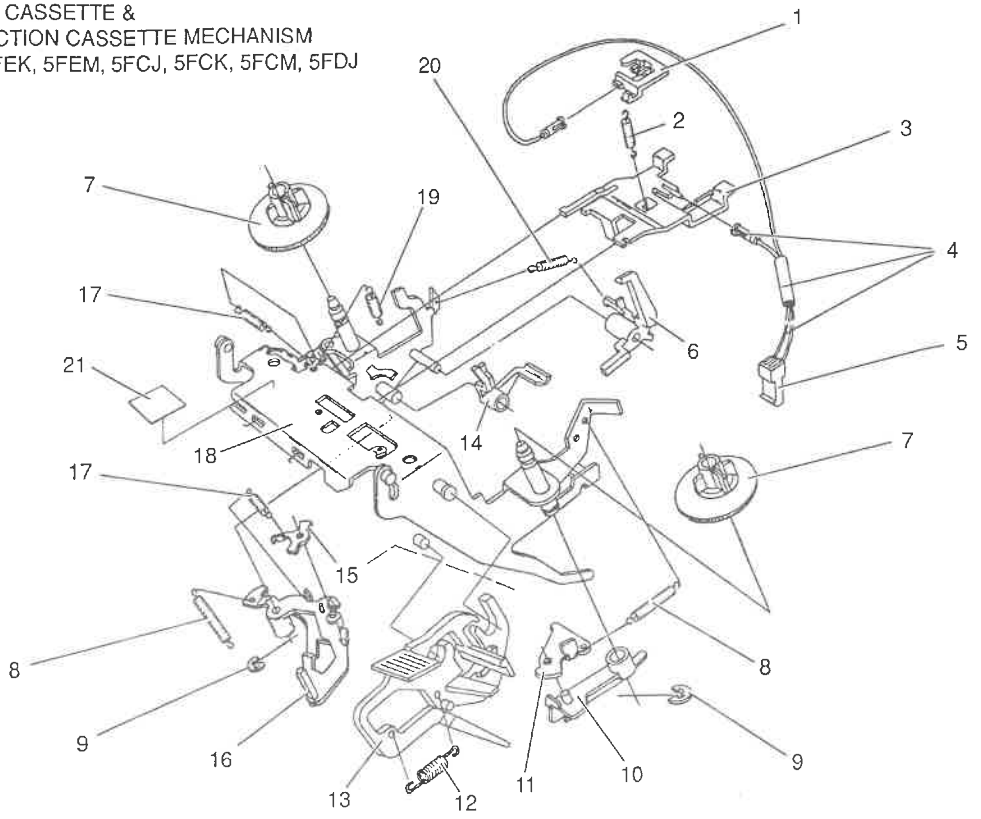
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	467980	E-Ring	1	9	752735	Thrust Washer	1
2	749965	Outside Scissor Gear	1	10	740004	Element Drive Shaft	1
3	745060	Element Gear Spring	1	11	774871	Element Motor Assembly	1
4	745321	Inside Scissor Gear	1	12	790001	Element Motor Plate	1
5	747258	Self Tap Screw	1	13	770297	Screw	2
6	740143	Bearing	2	14	105090	Flat Washer	2
7	752734	Bearing Retainer	2	15	790008	Shoulder Screw	1
8	782619	Spring	1				

RIBBON DRIVE



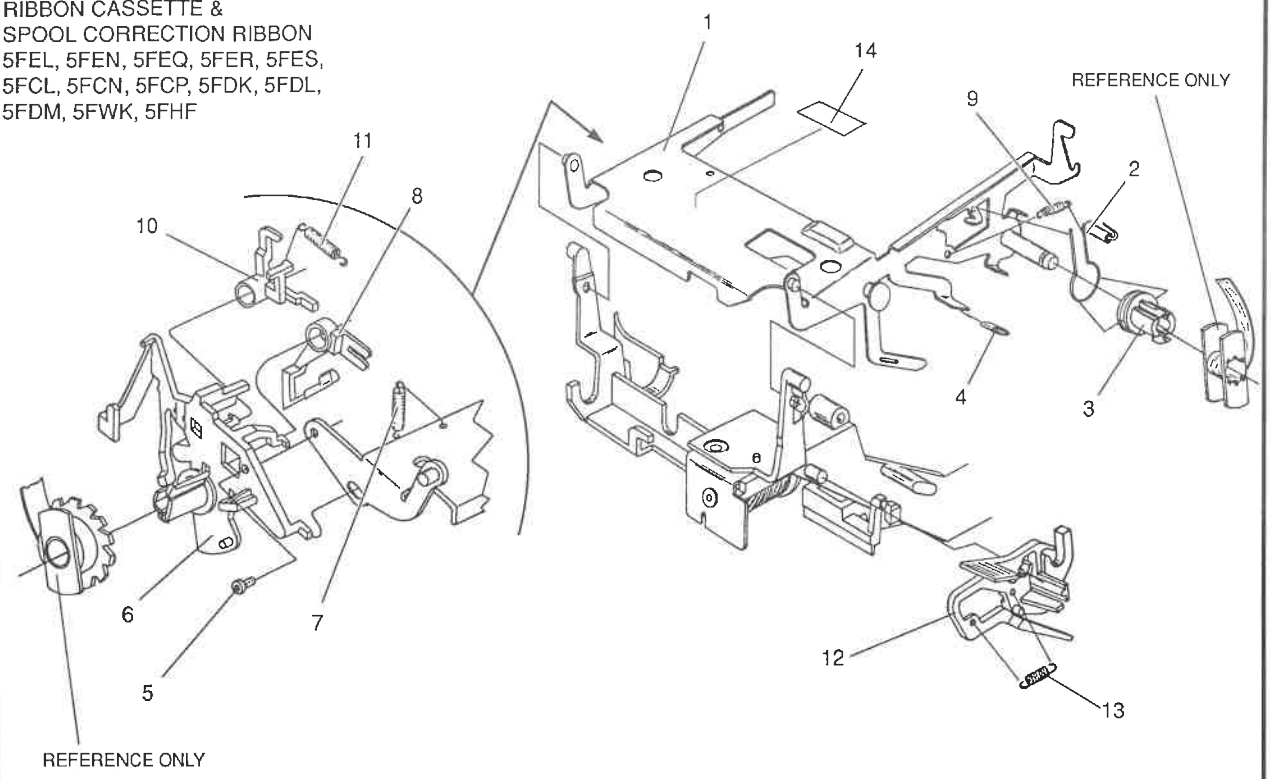
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	747258	Self Tap Screw	1	11	736900	Connector, 2 Pin	1
2	781725	Bumper	1	12	770317	Wire Binder Retainer	1
3	797155	Correction Lift Slider	1	13	770298	Wire Strap	1
4	467980	E-Ring	1	14	428090	Spring	1
5	796153	Correction Lift Pivot Stud	1	15	771411	Ribbon Feed Plunger	1
6	775292	Correction Lift Bellcrank	1	16	770833	Anti-Backup Spring	1
7	770277	Plunger Spring	1	17	796260	Ribbon Feed Shaft Assembly	1
8	777242	Self Tap Screw	1	18	749841	Spring	1
9	770868	E-Ring	1	19	770292	Ribbon Driver	1
10	782122	Ribbon Drive Solenoid, w/Ref 11	1				

RIBBON CASSETTE &
CORRECTION CASSETTE MECHANISM
5FEJ, 5FEK, 5FEM, 5FCJ, 5FCK, 5FCM, 5FDJ



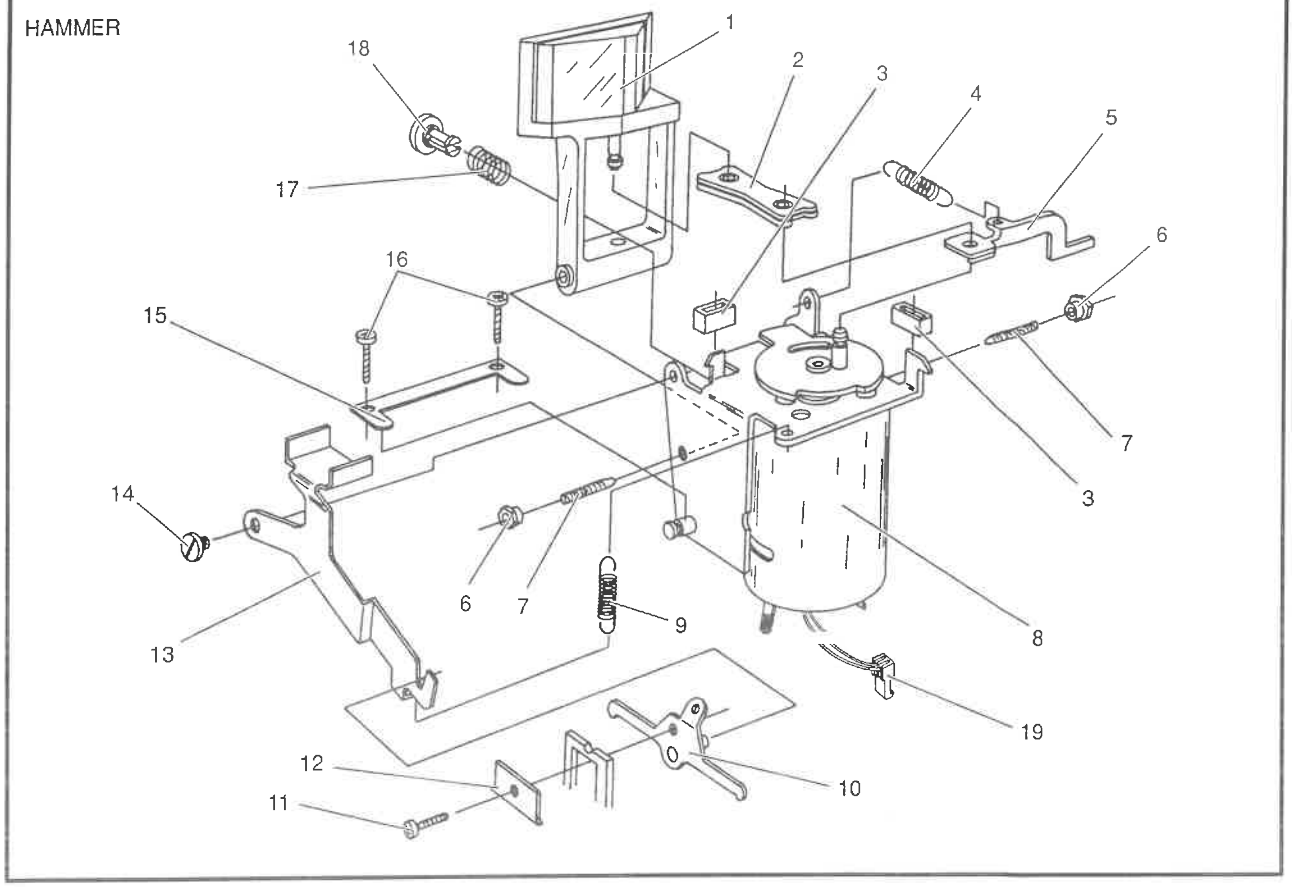
REF	PART NUMBER	PART NAME	QTY
1	771796	Upper Contact Switch Holder	1
2	133250	Spring	1
3	771797	Lower Contact Switch Holder	1
4	783836	Cassette Switch Wire Assembly, w/Ref 5	1
5	736900	Connector, 2 Pin	1
6	772111	Cassette Latch	1
7	771818	Ribbon Hub Ratchet	2
8	771917	Spring	2
9	771912	E-Ring	2
10	777003	Tension Carrier	1
11	777004	Tension Pawl	1
12	777002	Spring	1
13	793350	Carrier Restraint Latch	1
14	796299	Correction Ribbon Feed Arm	1
15	771807	Correction Ribbon Feed Pawl	1
16	771826	Correction Ribbon Actuator	1
17	428090	Spring	2
18	777008	Correction Bail Assembly (Correction Cassette Models)	1
19	770686	Spring	1
20	771843	Spring	1
		Unique International Label	
21	792234	Caution: Hot Label, United Kingdom, Australia	1

RIBBON CASSETTE &
SPOOL CORRECTION RIBBON
5FEL, 5FEN, 5FEQ, 5FER, 5FES,
5FCL, 5FCN, 5FCP, 5FDK, 5FDL,
5FDM, 5FWK, 5FHF



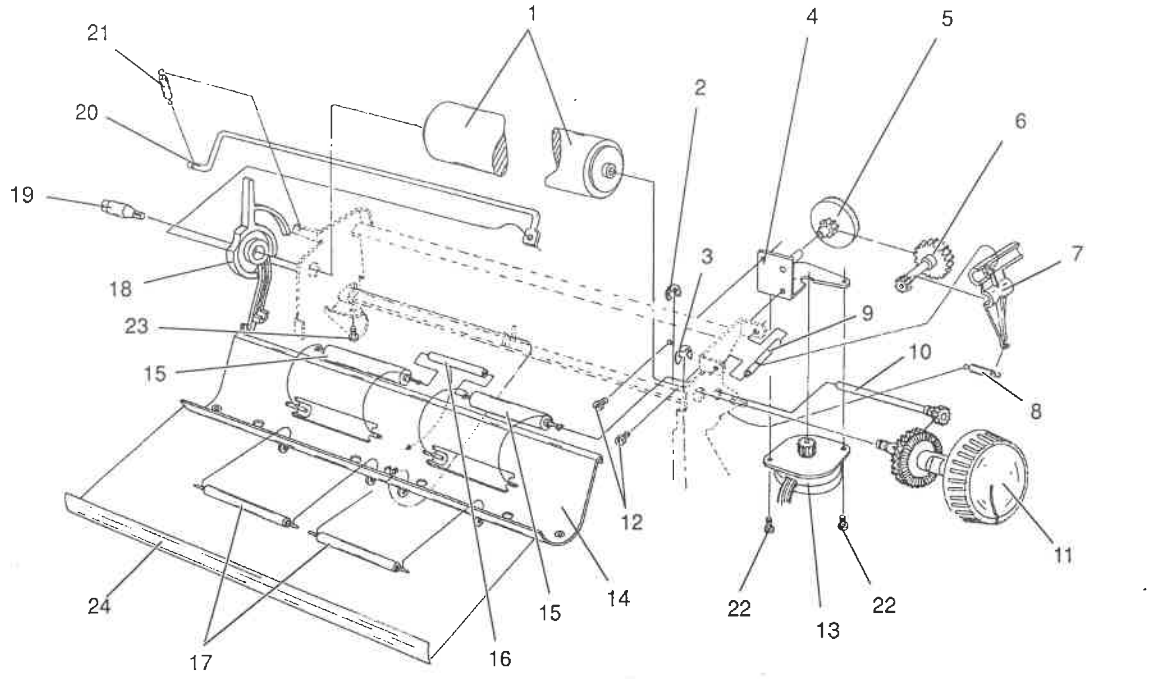
REF	PART NUMBER	PART NAME	QTY
1	790005	Correction Bail Assembly (Spool Correction Models)	1
2	771502	Correction Brake Spring	1
3	740108	Correction Spool Hub	1
4	749494	Vinyl Tubing	1
5	771466	Screw	1
6	770293	Left Correction Arm	1
7	770686	Spring	1
8	770288	Correction Feed Pawl	1
9	428090	Spring	1
10	770291	Cassette Latch	1
11	740111	Spring	1
12	793350	Carrier Restraint Latch	1
13	777002	Spring	1
		Unique International Label	
14	792234	Caution: Hot Label, United Kingdom, Australia	1

HAMMER



REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	796281	Hammer	1	11	770297	Screw	1
2	796257	Hammer Link Assembly	1	12	770282	Hammer Adjusting Washer	1
3	796147	Downstop	2	13	796268	Hammer Latch Lever	1
4	796302	Spring	1	14	771469	Screw	1
5	796288	Ribbon Feed Pawl	1	15	796707	Hammer Motor Retainer	1
6	770296	Pivot Nut	2	16	747258	Self Tap Screw	2
7	771794	Pivot Screw	2	17	770924	Pusher Spring	1
8	796855	Hammer/Ribbon Motor Assembly, w/Ref 19	1	18	749735	Printwheel Pusher	1
9	770686	Spring	1	19	736900	Connector, 2 Pin	1
10	770284	Hammer Adjusting Plate	1				

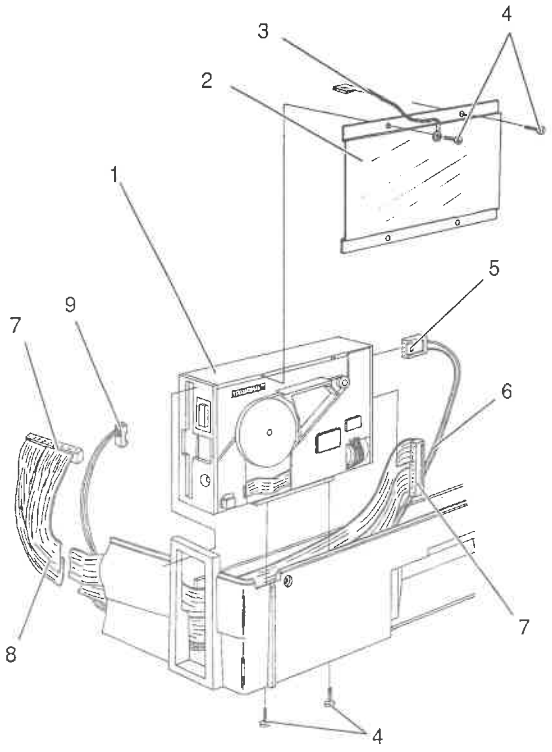
PAPER FEED



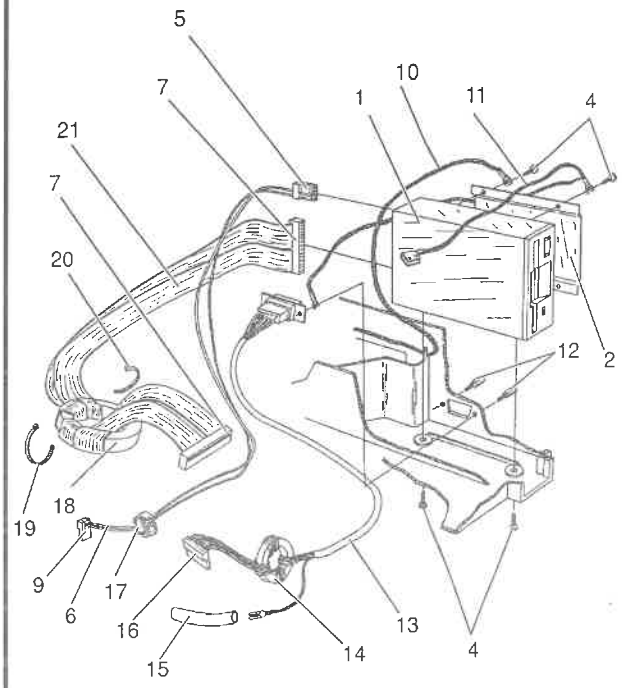
REF	PART NUMBER	PART NAME	QTY
1	790930	Platen Assembly	1
2	105100	E-Ring	1
3	771930	E-Ring	1
4	783199	Linespace Bracket	1
5	770165	Pinion Face Gear	1
6	750056	Linespace Pinion	1
7	771462	Linespace Pinion Pivot	1
8	770199	Linespace Pinion Pivot Spring	1
9	771460	Pinion Pivot Pin	1
10	790939	Drive Shaft, Gear	1
11	790830	Platen Knob Assembly, w/Gear, Accent Gray	1
12	771466	Self Tap Screw	2
13	770181	Index Motor Assembly 5FEJ, 5FEK, 5FEM, 5FCJ, 5FCK, 5FCM, 5FDJ	
13	770183	Index Motor Assembly 5FEL, 5FEN, 5FEQ, 5FER, 5FES, 5FCL, 5FCN, 5FCP, 5FDK, 5FDL, 5FDM, 5FWK, 5FHF	
14	796691	Paper Table, Nickel, w/Ref 24	1
15	790801	Paper Feed Roller, Rear	2
16	790805	Link	1
17	771611	Paper Feed Roller, Front	2
18	791941	Paper Release Lever, Accent Gray	1
19	750075	Left Platen Shaft	1
20	783204	Paper Release Shaft	1
21	751437	Paper Release Spring	1
22	771461	Self Tap Screw	2
23	781557	Self Tap Screw	1
24	796714	Paper Deflector	1

DISK DRIVES

5FEN, 5FEQ, 5FER, 5FES,
5FCN, 5FCP, 5FDL, 5FDM



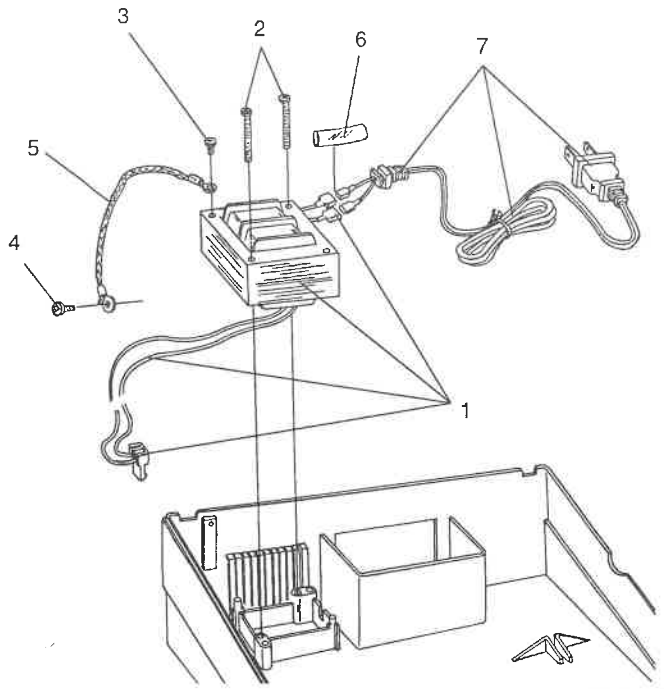
5FEL, 5FCL, 5FDK,
5FWK, 5FHF



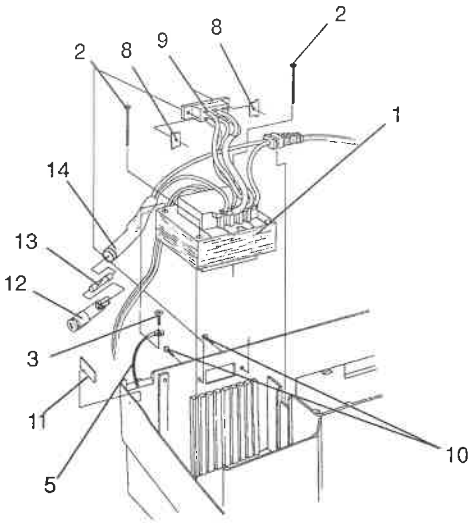
REF	PART NUMBER	PART NAME	QTY
		8 and 16 Line LCD Models: 5FEN, 5FEQ, 5FER, 5FES, 5FCN, 5FCP, 5FDL, 5FDM	
1	769270	Disk Drive, 3.5", Double Sided, Double Density	1
2	793776	Disk Drive Cover (for use with 792853 Control PC Board with Discrete Components only--Refer to Service Bulletin #2)	1
3	761235	Ground Cable	1
4	950542	Screw	4
5	950676	Connector, 4 Position	1
6	760140	Disk Drive Power Cable, w/Ref 5 & 9 (for use with 792853 Control PC Board with Discrete Components only--Refer to Service Bulletin #2)	1
6	921993	Disk Drive Power Cable, w/Ref 5 & 9 (for use with 790281, 790288, 790290, & 790297 Control PC Boards with ASIC--Refer to Service Bulletin #2)	1
7	950686	Connector, 34 Position, Dual Row	2
8	782341	Disk Drive Cable, w/Ref 7	1
9	751067	Connector, 2 Position	1
		Unique International Disk Drive	
1	769271	Disk Drive, 3.5", Double Sided, Double Density, Germany, Holland	1

REF	PART NUMBER	PART NAME	QTY
		Monitor Models: 5FEL, 5FCL, 5FDK, 5FWK, 5FHF	
1	769270	Disk Drive, 3.5", Double Sided, Double Density	1
2	793776	Disk Drive Shield	1
4	950542	Screw	4
5	950676	Connector, 4 Position	1
6	760140	Disk Drive Power Cable w/Ref 5, 9 & 17	1
7	950686	Connector, 34 Position	2
9	751067	Connector, 2 Position	1
10	761237	Ground Cable	1
11	782425	Ground Cable	1
12	752707	Standoff	2
13	768239	Video Cable w/Ref 14 & 16	1
14	782289	Toroid	1
15	724936	PVC Tubing	1
16	768260	Connector 5 Position	1
17	725231	Toroid	1
18	769447	Toroid	1
19	701358	Cable Tie	1
20	700523	Cable Tie	1
21	951203	Disk Drive Cable w/Ref 7, 18 & 20	1

TRANSFORMER
5FEJ, 5FEK, 5FEM,
5FCJ, 5FCK, 5FCM,
5FDJ



SPANISH AMERICAN
DUAL VOLTAGE
MACHINES ONLY

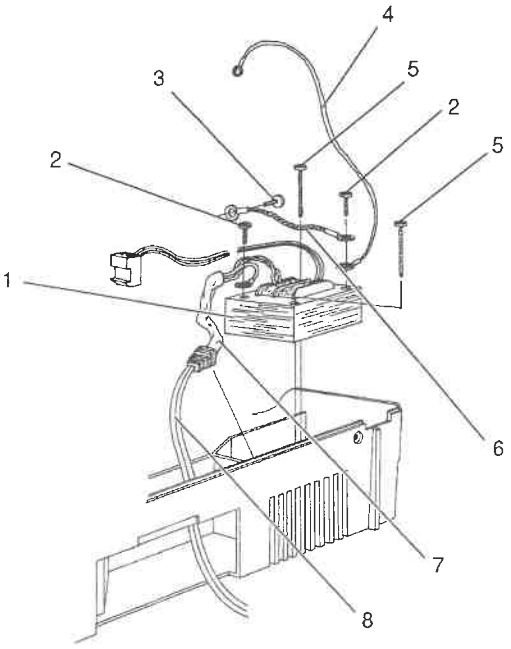


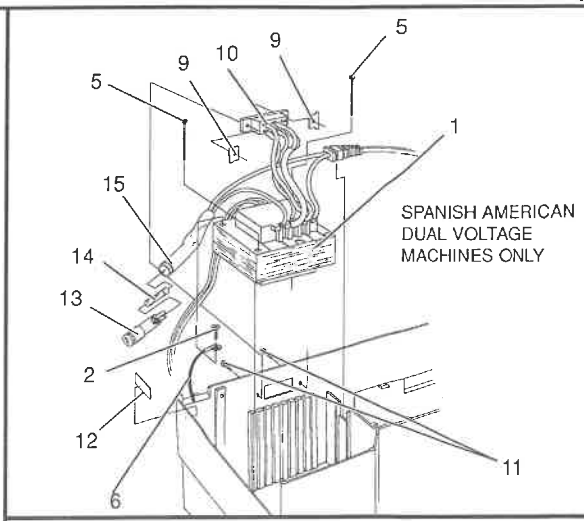
REF	PART NUMBER	PART NAME	QTY
1	783452	Transformer Assembly, with Attached Line Cord 120V/60Hz, 5FEJ, 5FEK, 5FEM, 5FCJ, 5FCK, 5FCM, 5FDJ, USA, Canada	1
2	782219	Transformer Screw	2
3	781952	Self Tap Screw	1
4	781910	Self Tap Screw	1
5	760923	Ground Cable	1
		Unique International Parts	
1	783250	Transformer Assembly, with Attached Line Cord, 240V/50Hz, 5FEM, 5FCM, United Kingdom (see note)	1
1	910894	Transformer Assembly, with Attached Line Cord, 240V/50Hz, 5FEM, Australia (see note)	1
1	910968	Transformer Assembly, w/Ref 6 & 7, with Detachable Line Cord, 230V/50Hz, 5FEM, S. Africa, Germany, Holland, France, Spain, Switzerland, Italy (see note)	1
1	910939	Transformer Assembly, w/Ref 9, 12, 13 & 14, with Attached Line Cord, Dual Voltage (115V/60Hz & 230V/50Hz), 5FEM, Spanish American, Chile (see note)	1

REF	PART NUMBER	PART NAME	QTY
		Unique International Parts (continued)	
6	753616	Tubing for use with 910968	1
7	783516	Line Cord for use with 910968	1
8	791577	Switch Nut Plate	2
9	791571	Voltage Selector Switch	1
10	783194	Self Tap Screw	2
11	767100	Fuse Warning Label	1
12	791572	Fuse Holder Cap	1
13	790740	Fuse, 2 Amp, 250V, Fast Acting	1
14	705361	Tubing for use with 910939	1
15	783888	Plug Adaptor, 230V/50Hz, for use with 910939 (not illustrated)	1

Note: International Transformers are available for sale only to International Distributors.

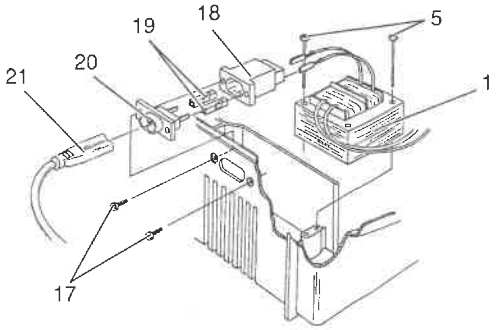
TRANSFORMER
5FEN, 5FEQ, 5FER, 5FES,
5FCN, 5FCP, 5FDL, 5FDM





SPANISH AMERICAN
DUAL VOLTAGE
MACHINES ONLY

UK & AUSTRALIAN MACHINES WITH DETACHABLE LINE CORD

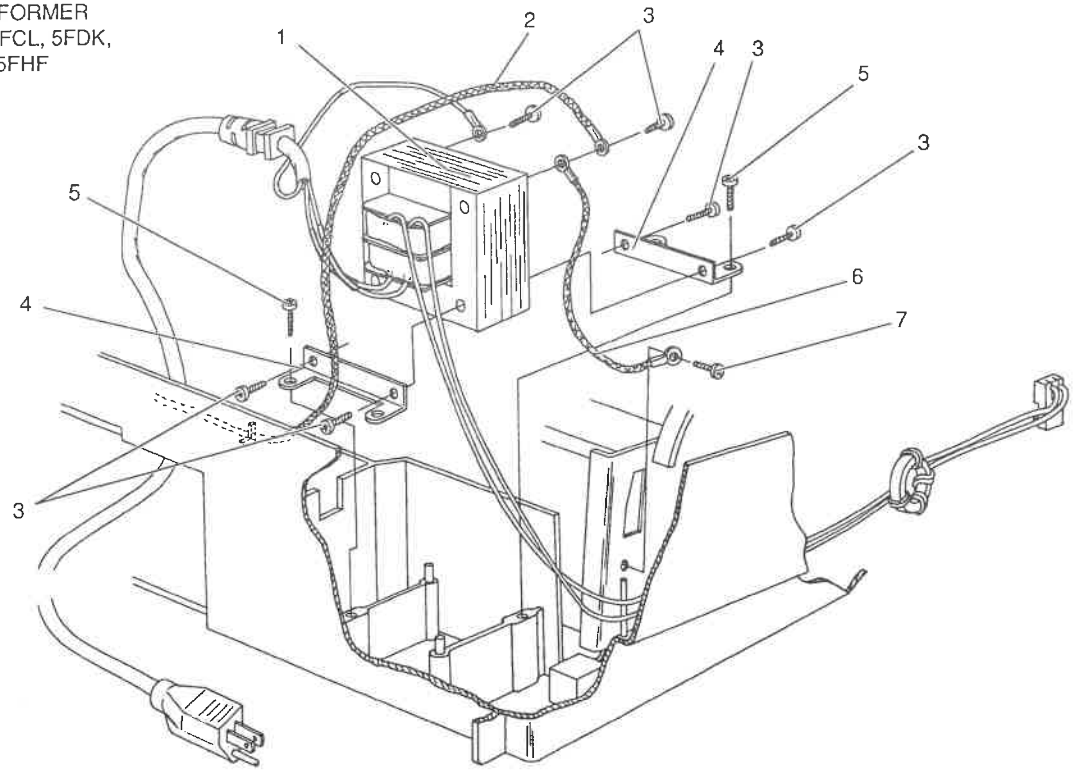


REF	PART NUMBER	PART NAME	QTY
1	783440	Transformer Assembly, with Attached Line Cord, 120V/60Hz, USA, Canada (for use with 790281, 790288, 790290, & 790297 Control PC Boards with ASIC--Refer to Service Bulletin #2)	1
1	910938	Transformer Assembly, with Attached Line Cord, 120V/60Hz, USA (for use with 792853 Control PC Board with Discrete Components only--Refer to Service Bulletin #2)	1
2	781952	Self Tap Screw	2
3	781910	Self Tap Screw	1
4	761237	Ground Cable	1
5	782219	Transformer Screw	2
6	760923	Ground Cable	1

REF	PART NUMBER	PART NAME	QTY
		Unique International Parts	
1	910983	Transformer Assembly, w/Ref 7 & 8, with Detachable Line Cord, 230V/50Hz, Germany, Holland, France, Spain (see note below)	1
1	910939	Transformer Assembly, w/Ref 11, 13, 14 & 15, with Attached Line Cord, Dual Voltage (115V/60Hz & 230V/50Hz), Spanish American, Chile (see note below)	1
1	911086	Transformer Assembly, w/Ref 18, 19 & 20, with Detachable Line Cord, 240V/50Hz, United Kingdom, Australia (see note below)	1
7	753616	Tubing for use with 910983	1
8	783516	Line Cord for use with 910983	1
9	791577	Switch Nut Plate	2
10	791571	Voltage Selector Switch	1
11	783194	Self Tap Screw	2
12	767100	Fuse Warning Label	1
13	791572	Fuse Holder Cap	1
14	790740	Fuse, 2 Amp, 250V, Fast Acting	1
15	705361	Tubing for use with 910939	1
16	783888	Plug Adaptor, 230V/50Hz, for use with 910939 (not illustrated)	1
17	765120	Screw	2
18	782758	Receptacle Cover	1
19	782759	Terminal Housing	2
20	766409	Appliance Coupler	1
21	793120	Cordset, Detachable, United Kingdom, for use with 911086	1
21	793122	Cordset, Detachable, Australia, for use with 911086	1

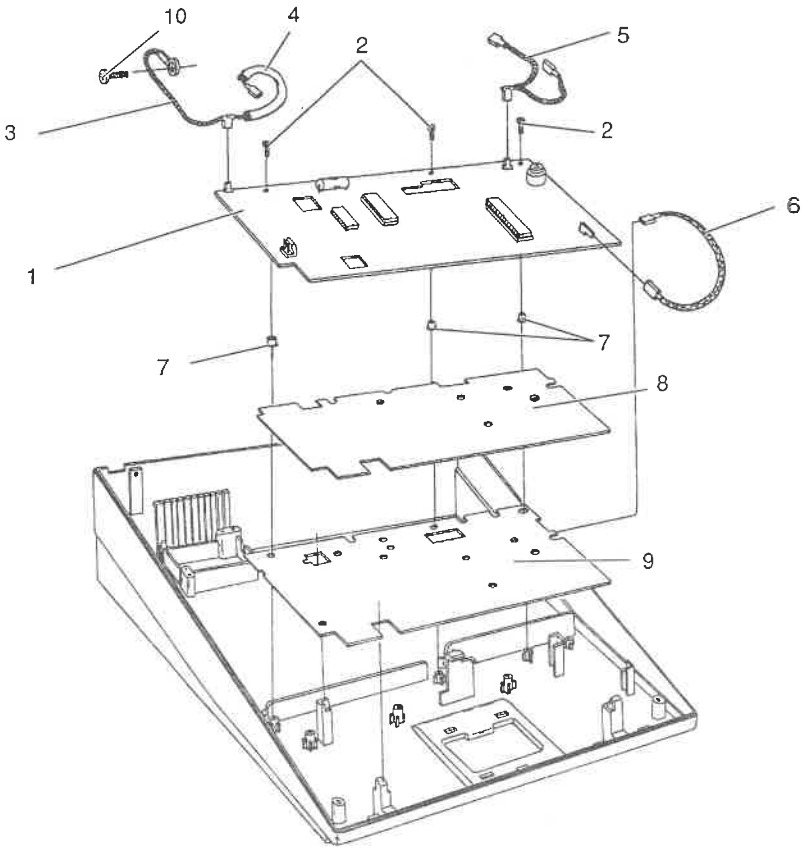
Note: International Transformers are available for sale only to International Distributors.

TRANSFORMER
5FEL, 5FCL, 5FDK,
5FWK, 5FHF



REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	910938	Transformer Assembly, with Attached Line Cord, 120V/60Hz, USA	1	5	747258	Screw	2
2	761237	Ground Cable	1	6	760923	Ground Cable	1
3	781952	Screw	6	7	781910	Screw	1
4	769545	Transformer Bracket	2				

CONTROL PC BOARD
5FEJ, 5FEK, 5FEM,
5FCJ, 5FCK, 5FCM, 5FDJ



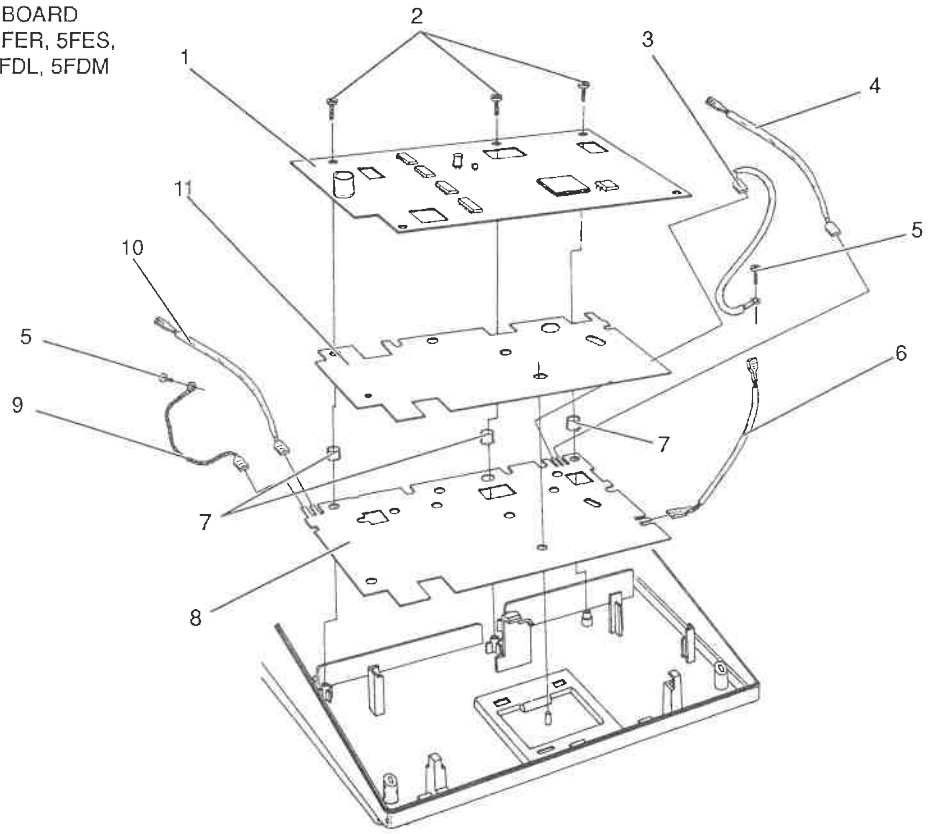
REF	PART NUMBER	PART NAME	QTY
1	791900	Control PC Board, 5FEJ, 5FCJ, USA	1
1	790702	Control PC Board, 5FEK, 5FCK, 5FDJ, USA	1
2	747258	Screw	3
3	782417	Ground Cable Assembly	1
4	724941	PVC Tubing	1
5	784146	Ground Cable Assembly	1
6	760921	Ground Cable Assembly	1
7	768104	Standoff	3
8	790415	Insulator	1
9	790422	Ground Shield	1
10	781910	Screw	1

International Control PC Boards

REF	PART NUMBER	PART NAME	QTY
1	791901	Control PC Board, 5FEJ, 5FCJ, Canada	1
1	790713	Control PC Board, 5FEM, 5FCM, International (see note below)	1

Note: Control PC Board 790713 is supplied with Sockets in Positions U5 and U18. Refer to Page 26 to order the appropriate U5 and U18 Software ROM's for each country.

CONTROL PC BOARD
5FEN, 5FEQ, 5FER, 5FES,
5FCN, 5FCP, 5FDL, 5FDM

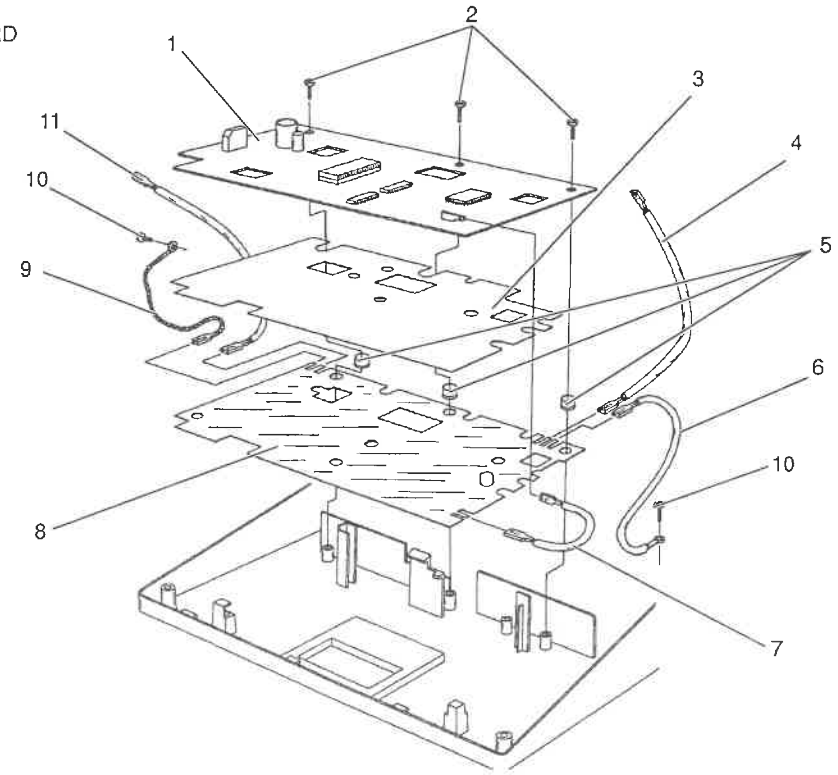


REF	PART NUMBER	PART NAME	QTY
1	792853	Control PC Board with Discrete Components, 5FCN, 5FDL, USA (refer to Service Bulletin #2)	1
1	790281	Control PC Board with ASIC, 5FCN, 5FDL, USA (refer to Service Bulletin #2)	1
1	790288	Control PC Board, 5FER, USA	1
1	790290	Control PC Board, 5FES, 5FCP, 5FDM, USA	1
2	747258	Screw Note: ASIC PC Boards only require 2 Screws.	3
3	761237	Ground Cable Assembly	1
4	761224	Ground Cable Assembly	1
5	781910	Screw	2
6	761225	Ground Cable Assembly	1
7	921680	Standoff Note: ASIC PC Boards only require 2 Standoffs.	3
8	790422	Ground Shield	1
9	761222	Ground Cable Assembly	1
10	761223	Ground Cable Assembly	1
11	793587	Insulator	1

REF	PART NUMBER	PART NAME	QTY
		International Control PC Board	
1	790297	Control PC Board, 5FEN, 5FEQ, 5FER, 5FES, 5FCN, International (see note below)	1

Note: Control PC Board 790297 is supplied with Sockets in Positions U11 and U46, a 14 Volt Zener Diode in Position VR4, and jumper selected for a 4 Meg ROM in Position U46. Refer to Page 31 to order the appropriate U11 and U46 Software ROM's for each model and country. Use the Jumper/Diode Chart in Service Manual, Form 3-0836 to configure the PC Board for the appropriate model and country.

CONTROL PC BOARD
5FEL, 5FCL, 5FDK,
5FWK, 5FHF

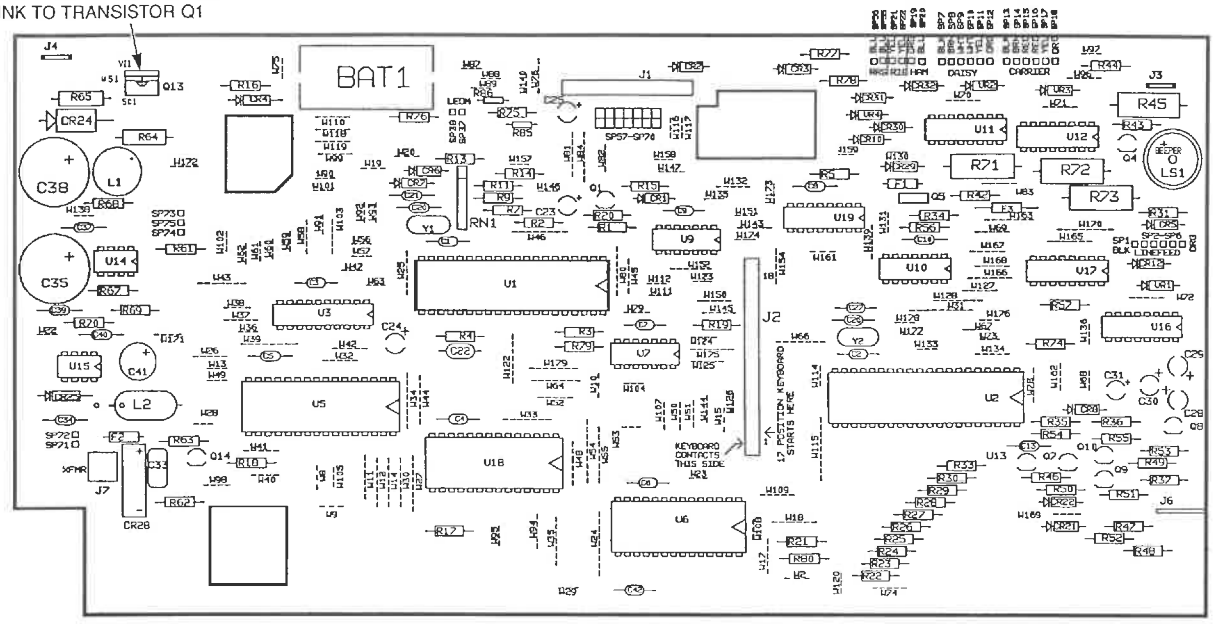


REF	PART NUMBER	PART NAME	QTY
1	793715	Control PC Board, 5FEL, 5FCL, 5FDK, 5FWK, 5FHF, USA	1
2	747258	Screw	3
3	793587	Insulator	1
4	761224	Ground Cable Assembly	1
5	921680	Standoff	3
6	761237	Ground Cable Assembly	1
7	761225	Ground Cable Assembly	1
8	790422	Ground Shield	1
9	761222	Ground Cable Assembly	1
10	781910	Screw	2
11	761223	Ground Cable Assembly	1

CONTROL P.C. BOARD
COMPONENT LISTING
5FEJ, 5FEK, 5FEM,
5FCJ, 5FCK, 5FCM, 5FDJ

P/N 791900—USA (5FEJ, 5FCJ)
790702—USA (5FEK, 5FCK, 5FDJ)
791901—CANADA (5FEJ, 5FCJ)
790713—INTERNATIONAL (5FEM, 5FCM)

SC1, VI1, AND WS1 ARE
USED FOR MOUNTING HEAT
SINK TO TRANSISTOR Q1



COMPONENT	PART NUMBER	DESCRIPTION
BAT 1	747288	Battery, Ni-Cad, 2 Cell, 2.3V
C1-C3, C7-C10, C42	700341	Capacitor, .01µF/50V, Axial, Ceramic, ± 20%
C4-C6, C13, C34, C39	741566	Capacitor, .1µF/50V, Axial, Ceramic, +80/-20%
C20, C21, C26, C27	700365	Capacitor, 30pF/100V, Axial, Ceramic, ± 5%
C22	741574	Capacitor, 56pF/50V, Axial, Ceramic, ± 10%
C23, C25, C31	736112	Capacitor, 1µF/50V, Radial, Electric
C24, C28-C30	770207	Capacitor, 10µF/16V, Radial, Electric, ± 20%
C33	736300	Capacitor, .1µF/100V, Radial, Poly Film, ± 10%
C35	730024	Capacitor, 2200µF/50V, Radial, Electric
C37	741575	Capacitor, 390pF/100V, Axial, Ceramic, ± 5%
C38	730022	Capacitor, 3300µF/25V, Radial, Electric, ± 20%
C40	741576	Capacitor, 270pF/100V, Axial, Ceramic, ± 5%
C41	730033	Capacitor, 1000µF/6.3V, Radial, Electric
CR1, CR2, CR3, CR5-CR8, CR21, CR22	709100	Diode, Switch, 100V, 1N914
CR4, CR25	760421	Diode, 1 Amp, Schottky, 1N5819
CR10, CR29-CR32	722058	Diode, 1 Amp, Fast Recovery, 1N4933
CR12	700521	Diode, Rectifier, 50V, 1N4001
CR24	760479	Diode, 3 Amp, 50V, Schottky, MBR 350
CR28	734802	Bridge Rectifier, 4 Amp, 100V
F2	793050	Pico Fuse, 2A, 125V, Slo-Blo
F3	735780	Fuse, .6A, 250V, Slo-Blo
J1	747270	Connector, Low Profile, 14 Position, .100
J2	770150	Connector, .100, 17 Position Flex Cable
J2	770152	Connector, .100, 18 Position Flex Cable
J3, J4	740440	Terminal-Faston, .250 Tab
J6	783579	Connector, Right Angle, .110
J7	723357	Header, Lock Post, 2 Position, .156
L1	783573	Inductor, Axial, 80µH, 6 Amp
L2	781901	Inductor, Axial, 100µH
LS1 (Beeper)	728783	Audio Transducer, 12V
Q1, Q7, Q9, Q10, Q14	702518	Transistor, NPN, .2 Amp, Switching, 2N3904
Q4	736604	Transistor, PNP, 1.5 Amp, MPS750
Q5	743086	Transistor, NPN, 4 Amp, Darlington, 2N6039
Q8	703714	Transistor, PNP, .2 Amp, Switching, 2N3906
Q13	591041	MOSFET, P-Channel, 50V, IRF9Z20

Italicized Components are for 24 Character LCD Models only.
Underscored Components are for 40 Character LCD Models only.

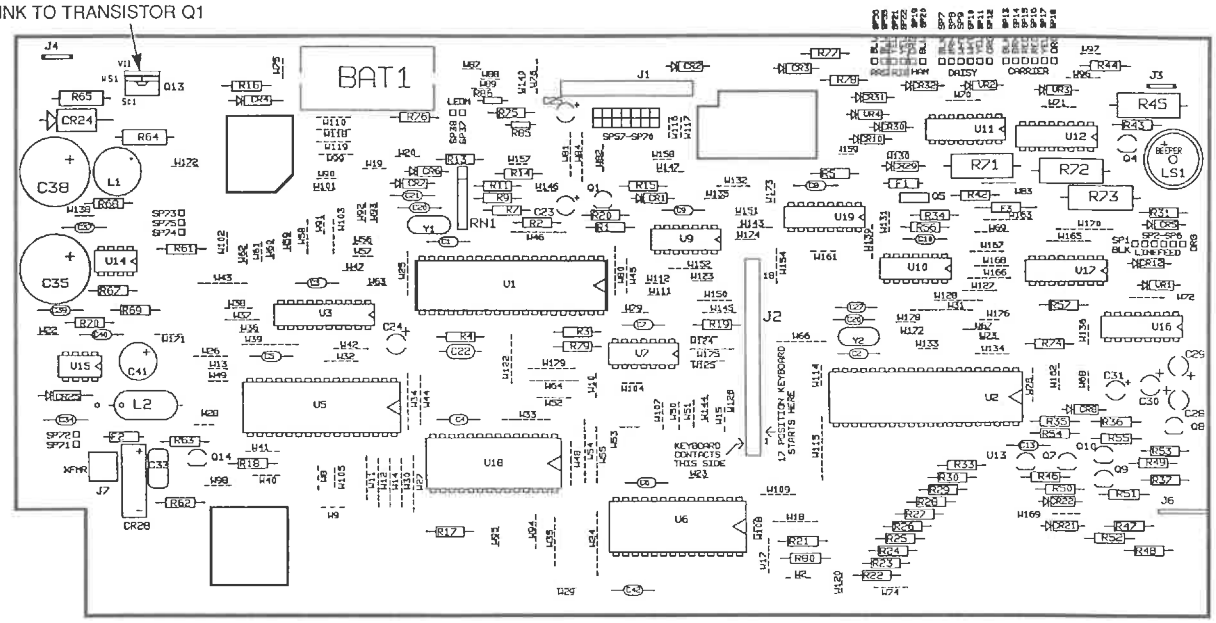
REF	PART NUMBER	PART NAME
R1, R35	748236	Resistor, 6.2 K Ω, 1/4W, 5%
R2, R36	748225	Resistor, 11 Ω, 1/4W, 5%
R3, ***R15***, R30, R33, R42, R56, R75, R76	701252	Resistor, 220 Ω, 1/4W, 5%
R4, R16-R18	701271	Resistor, 470 Ω, 1/4W, 5%
R5, R22, R23-R29, R34, R49	701287	Resistor, 39 K Ω, 1/4W, 5%
R7, R9, R11, R13, R14	701295	Resistor, 30 K Ω, 1/4W, 5%
R19, R21, R47, R48, R57, R61, R74, R79, R80	701268	Resistor, 10 K Ω, 1/4W, 5%
R20	701261	Resistor, 12 K Ω, 1/4W, 5%
R31	746938	Resistor, 390 Ω, 1/4W, 5%
R37, R46, R50-R52, R54, R55	701254	Resistor, 1 K Ω, 1/4W, 5%
R43	765833	Resistor, 1.3 K Ω, 1/2W, 5%, 1/4W Package
R44	701280	Resistor, 1.8 K Ω, 1/4W, 5%
R45	781501	Resistor, 220 Ω, 2W, 5%
R53	748227	Resistor, 220 K Ω, 1/4W, 5%
R62	701299	Resistor, 8.2 K Ω, 1/4W, 5%
R63	748235	Resistor, 62 K Ω, 1/4W, 5%
R64	760450	Resistor, 470 Ω, 1W, 5%
R65	760455	Resistor, 680 Ω, 1W, 5%
R67	748289	Resistor, 137 K Ω, 1/4W, 1%
R68, R69	748290	Resistor, 10.2 K Ω, 1/4W, 1%
R70	748291	Resistor, 3.4 K Ω, 1/4W, 1%
R71-R73	781513	Resistor, 6.8 Ω, 3W, 5%, 2W Package
R77, R78	701253	Resistor, 270 Ω, 1/4W, 5%
R85, R86	771001	Resistor, 390 Ω, 1/8W, 5%
RN1	782802	Resistor Network, 15 K Ω, 6 Pins
SC1	781910	Mounting Screw
SP1-SP22, SP37, SP38, SP55-SP70, SP71-SP75	748858	Stake Pin, .025 Square
U1	752400	IC, Microprocessor, 8032 AH, Master
U2	786992	IC, Microprocessor, 8052 AH, Slave
U3	709684	IC, Tri-State Octal Latch, 74LS373
U5	788083	IC, 2 Meg ROM, Master & Dictionary, USA
U6	781912	IC, CMOS, 8 K x 8 Static RAM, 6264
U6	751798	IC, CMOS, 32 K x 8 Static RAM, 43256
U7	709683	IC, Quad 2 Input And Gate, 74LS08
U9	782616	IC, Quad 2 Input CMOS NAND Gate, 74HC132
U10	724700	IC, Hex Inverter, Open Collector, 7406
U11, U12, U16	781722	IC, Quad Driver, w/Inverters, L-6220
U13	736602	IC, Reset, PST520C
U14, U15	782900	IC, Power Supply Controller, MC34063A
U17	769530	IC, Quad H Driver, L293B
U18	786993	IC, 23512 ROM, Master, USA
U19	751441	IC, CMOS, 3 to 8 Line Decoder, 74HC138
VI1	725119	Vinyl Insulator
VR1	769448	Diode, Zener, 12V, .5W, 1N5242B
VR3	765829	Diode, Zener, 2.4V, .5W, 1N5221
W1-W179, F1, ***VR1***, VR2, ***VR3***, VR4	705294	Jumper Wire
WS1	781628	Insulation Bushing
Y1, Y2	736950	Resonator, Ceramic, 12 Mhz

Italicized Components are for 24 Character LCD Models only.
Underscored Components are for 40 Character LCD Models only.

CONTROL P.C. BOARD
COMPONENT LISTING
5FEJ, 5FEK, 5FEM,
5FCJ, 5FCK, 5FCM, 5FDJ

P/N 791900—USA (5FEJ, 5FCJ)
790702—USA (5FEK, 5FCK, 5FDJ)
791901—CANADA (5FEJ, 5FCJ)
790713—INTERNATIONAL (5FEM, 5FCM)

SC1, VI1, AND WS1 ARE
USED FOR MOUNTING HEAT
SINK TO TRANSISTOR Q1



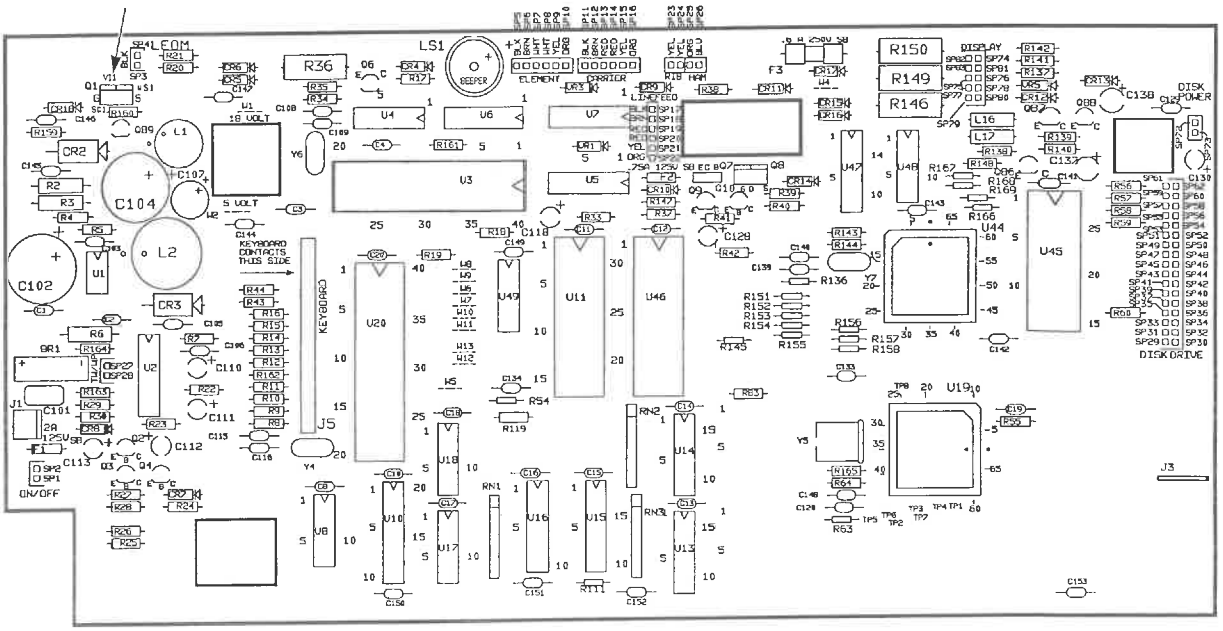
COMPONENT	PART NUMBER	DESCRIPTION
International		
F1	793051	Pico Fuse, .75A, 125V, Slo-Blo (230V/50Hz and 240V/50Hz machines **only**)
U5	788168	IC, 2 Meg ROM, Dictionary, Canada
U5	788014	IC, 2 Meg ROM, Dictionary, UK, Australia, South Africa
U5	788013	IC, 2 Meg ROM, Dictionary, Spanish American
U5	750926	IC, 4 Meg ROM, Dictionary, Germany
U5	786501	IC, 4 Meg ROM, Dictionary, Holland
U5	786413	IC, 4 Meg ROM, Dictionary, France
U5	750927	IC, 4 Meg ROM, Dictionary, Spain
U5	786246	IC, 4 Meg ROM, Dictionary, Switzerland
U5	786230	IC, 4 Meg ROM, Dictionary, Italy
U18	788047	IC, 23512 ROM, Master, Canada
U18	788025	IC, 23512 ROM, Master, Canada
U18	788026	IC, 23512 ROM, Master, UK, Australia, South Africa
U18	788029	IC, 23512 ROM, Master, Spanish American
U18	788027	IC, 23512 ROM, Master, Germany
U18	788028	IC, 23512 ROM, Master, Holland
U18	788030	IC, 23512 ROM, Master, France
U18	788031	IC, 23512 ROM, Master, Spain
U18	788033	IC, 23512 ROM, Master, Switzerland
U18	788032	IC, 23512 ROM, Master, Italy

Italicized Components are for 24 Character LCD Models only.
Underscored Components are for 40 Character LCD Models only.

CONTROL P.C. BOARD
COMPONENT LISTING
5FCN, 5FDL
(WITH DISCRETE COMPONENTS)

P/N 792853—USA

SC1, VI1, AND WS1 ARE
USED FOR MOUNTING HEAT
SINK TO TRANSISTOR Q1

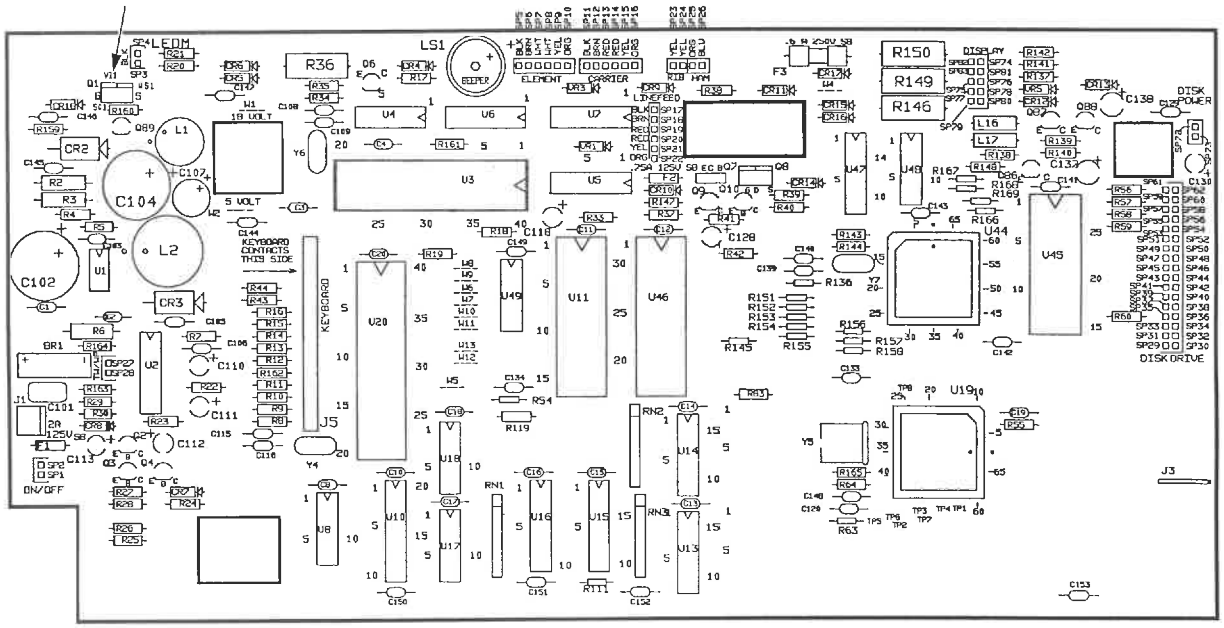


COMPONENT	PART NUMBER	DESCRIPTION
BR1	734802	Bridge Rectifier, 4 Amp, 100V
C1, C2, C11, C12, C15, C16, C19, C20, C106, C129, C134, C141-C144, C147	741566	Capacitor, .1µF/50V, Axial, Ceramic, +80/-20%
C3, C4, C8, C10, C13, C14, C17, C18, C149-C153	700341	Capacitor, .01µF/50V, Axial, Ceramic, ± 20%
C101	736300	Capacitor, .1µF/100V, Radial, Poly Film, ± 10%
C102	730024	Capacitor, 2200µF/50V, Radial, Electric
C103	741575	Capacitor, 390pF/100V, Axial, Ceramic, ± 5%
C104	730022	Capacitor, 3300µF/25V, Radial, Electric, ± 20%
C105	700373	Capacitor, 680pF/100V, Axial, Ceramic, ± 5%
C107	730033	Capacitor, 1000µF/6.3V, Radial, Electric
C108, C109, C115, C116, C120, C148	700365	Capacitor, 30pF/100V, Axial, Ceramic, ± 5%
C110	736112	Capacitor, 1µF/50V, Radial, Electric
C111-C113, C118, C128, C130	770207	Capacitor, 10µF/16V, Radial, Electric, ± 20%
C133	741576	Capacitor, 270pF/100V, Axial, Ceramic, ± 5%
C137, C138	736101	Capacitor, 47µF/25V, Radial, Electric, ± 20%
C139, C140	741562	Capacitor, 100pF/50V, Axial, Ceramic, ± 10%
CR2, CR3	760479	Diode, 3 Amp, 50V, Schottky, MBR 350
CR4-CR8, CR12, CR13, CR18	709100	Diode, Switch, 100V, 1N914
CR9	700521	Diode, Rectifier, 50V, 1N4001
CR10, CR14-CR17	722058	Diode, 1 Amp, Fast Recovery, 1N4933
F1	793050	Pico Fuse, 2A, 125V, Slo-Blo
F3	735780	Fuse, .6A, 250V, Slo-Blo
J1	723357	Header, Lock Post, 2 Position, .156
J3	783579	Connector, Right Angle, .110
J5	770152	Connector, .100, 18 Position Flex Cable
L1	783573	Inductor, Axial, 80µH, 6 Amp
L2	781727	Inductor, Axial, 160µH, 6 Amp
L16, L17	766462	Ferrite Bead
LS1 (Beeper)	728783	Audio Transducer, 12V
Q1	591041	MOSFET, P-Channel, 50V, IRF9Z20
Q2, Q3, Q86, Q87, Q89	702518	Transistor, NPN, .2 Amp, Switching, 2N3904
Q4, Q88	703714	Transistor, PNP, .2 Amp, Switching, 2N3906
Q6	736604	Transistor, PNP, 1.5 Amp, MPS750
Q7	743086	Transistor, NPN, 4 Amp, Darlington, 2N6039

CONTROL P.C. BOARD
COMPONENT LISTING
5FCN, 5FDL
(WITH DISCRETE COMPONENTS)

P/N 792853—USA

SC1, VI1, AND WS1 ARE
USED FOR MOUNTING HEAT
SINK TO TRANSISTOR Q1

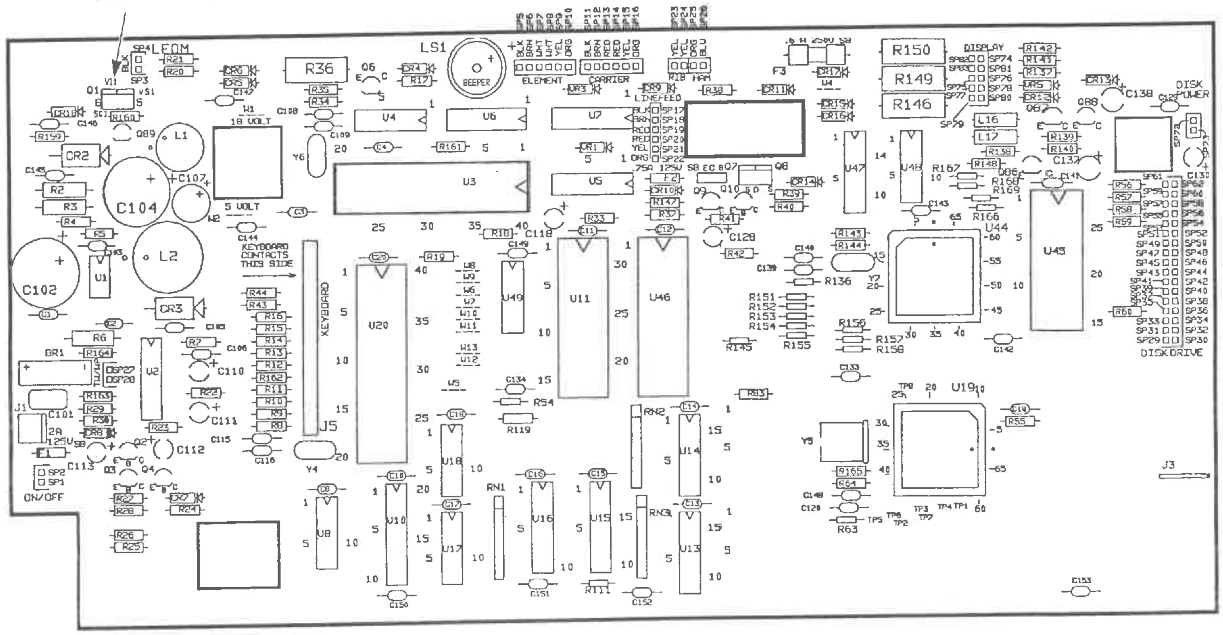


COMPONENT	PART NUMBER	DESCRIPTION
R2	760450	Resistor, 470 Ω, 1W, 5%
R3	760455	Resistor, 680 Ω, 1W, 5%
R4	748289	Resistor, 137 K Ω, 1/4W, 1%
R5	748290	Resistor, 10.2 K Ω, 1/4W, 1%
R6	773130	Resistor, .1 Ω, 1W, 5%, Wire Wound
R7, R22, R23, R25-R28, R139-R141, R165	701254	Resistor, 1 K Ω, 1/4W, 5%
R8-R15, R19, R30, R44	701287	Resistor, 39 K Ω, 1/4W, 5%
R16, R18, R33, R37, R43	701252	Resistor, 220 Ω, 1/4W, 5%
R17	746938	Resistor, 390 Ω, 1/4W, 5%
R20, R21, R163, R164	701253	Resistor, 270 Ω, 1/4W, 5%
R24	748227	Resistor, 220 K Ω, 1/4W, 5%
R29, R55, R83, R147, R148	701268	Resistor, 10 K Ω, 1/4W, 5%
R34	765833	Resistor, 1.3 K Ω, 1/2W, 5%, 1/4W Package
R35	701280	Resistor, 1.8 K Ω, 1/4W, 5%
R36	781501	Resistor, 220 Ω, 2W, 5%
R54, R63, R111, R136, R145, R151-R158, R166-R169	771001	Resistor, 390 Ω, 1/8W, 5%
R56-R60	701271	Resistor, 470 Ω, 1/4W, 5%
R64	748252	Resistor, 10 M Ω, 1/4W, 5%
R119	701274	Resistor, 33 Ω, 1/4W, 5%
R137	748245	Resistor, 39 Ω, 1/4W, 5%
R138	701255	Resistor, 2 K Ω, 1/4W, 5%
R142, R161, R162	748225	Resistor, 11 Ω, 1/4W, 5%
R143	748219	Resistor, 680 Ω, 1/4W, 5%
R144	701269	Resistor, 1 M Ω, 1/4W, 5%
R146, R149, R150	781513	Resistor, 6.8 Ω, 3W, 5%, 2W Package
RN1-RN3	950616	Resistor Network, 390 Ω, 1/8W, 8 Pins
SC1	781910	Mounting Screw
SP1-SP62, SP72-SP83	748858	Stake Pin, .025 Square

CONTROL P.C. BOARD
COMPONENT LISTING
5FCN, 5FDL
(WITH DISCRETE COMPONENTS)

P/N 792853—USA

SC1, VI1, AND WS1 ARE USED FOR MOUNTING HEAT SINK TO TRANSISTOR Q1

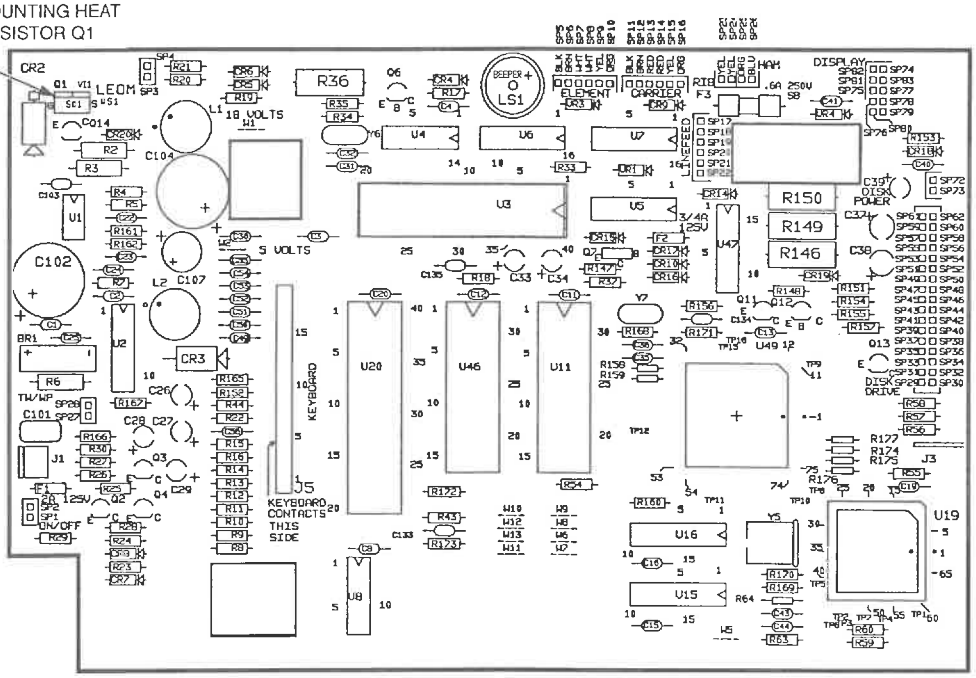


COMPONENT	PART NUMBER	DESCRIPTION
U1	782900	IC, Power Supply Controller, MC34063A
U2	769449	IC, Power Switching Regulator, 3 Amp, 34163
U3	786992	IC, Microprocessor, 8052 AH, Slave
U4, U48	724700	IC, Hex Inverter, Open Collector, 7406
U5-U7	781722	IC, Quad Driver, w/Inverters, L-6220
U8, U18	709683	IC, Quad 2 Input And Gate, 74LS08
U10	786854	IC, Logic Array, 35 ns, PAL16L8A
U11	788024	IC, 2 Meg EPROM, Master & Dictionary, USA
U13, U14	760020	IC, Quad 2 to 1 Selector, 74LS157
U15, U16	760511	IC, 64 K x 8 Dynamic RAM, 4164
U17	705236	IC, Hex Inverter, 74LS04
U19	769360	IC, Floppy Disk Controller, MCS3201
U20	752400	IC, Microprocessor, 8032 AH, Master
U44	790430	IC, ASIC, LCD Controller/Driver, 68 Pin
U45	781912	IC, CMOS, 8 K x 8 Static RAM, 6264
U47	769530	IC, Quad H Driver, L293B
VI1	725119	Vinyl Insulator
VR1	769448	Diode, Zener, 12V, .5W, 1N5242B
VR3	765829	Diode, Zener, 2.4V, .5W, 1N5221
VR5	791024	Diode, Zener, 13V, .5W, 1N5243B
W1, W2, F2	705294	Jumper Wire
WS1	781628	Insulation Bushing
Y4, Y6	736950	Resonator, Ceramic, 12 Mhz
Y5	769366	Crystal, Quartz, 24 MHz, 3 Pin
Y7	736955	Resonator, Ceramic, 2.5 MHz

CONTROL P.C. BOARD
COMPONENT LISTING
5FEN, 5FEQ, 5FER, 5FES,
5FCN, 5FCP, 5FDL, 5FDM
(WITH ASIC)

P/N 790281—USA (5FCN, 5FDL)
790288—USA (5FER)
790290—USA (5FES, 5FCP, 5FDM)
790297—INTERNATIONAL (5FEN, 5FEQ, 5FER, 5FES, 5FCN)

SC1, VI1, AND WS1 ARE
USED FOR MOUNTING HEAT
SINK TO TRANSISTOR Q1



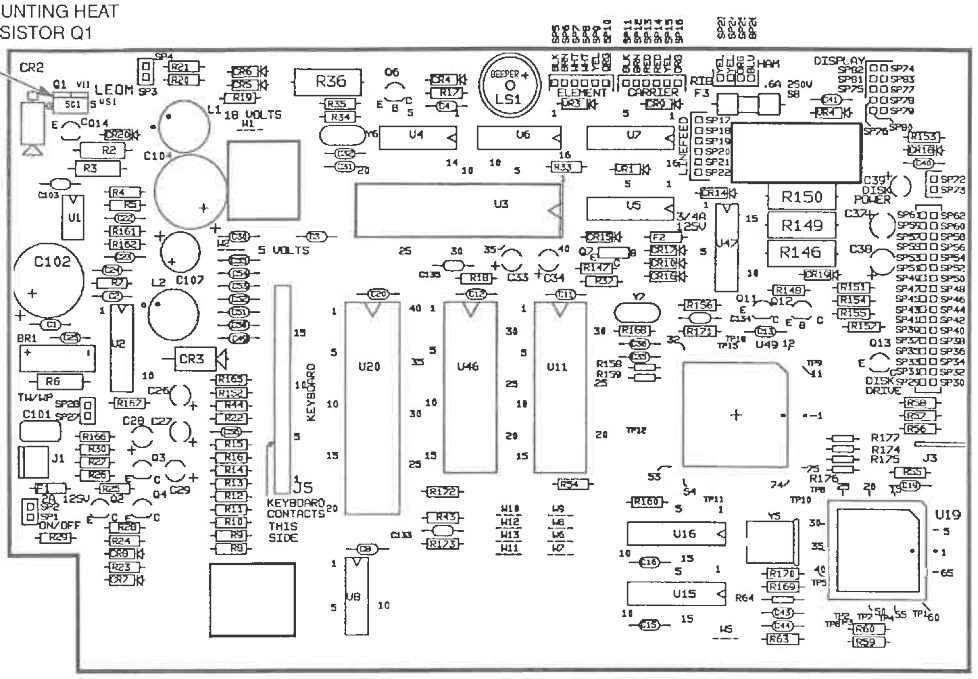
COMPONENT	PART NUMBER	DESCRIPTION
BR1	734802	Bridge Rectifier, 4 Amp, 100V
C1-C3, C11-C13, C15, C16, C19, C20, C24, C30, C40, C41	741566	Capacitor, .1µF/50V, Axial, Ceramic, +80/-20%
C4, C8, C22, C23	700341	Capacitor, .01µF/50V, Axial, Ceramic, ± 20%
C25	700373	Capacitor, 680pF/100V, Axial, Ceramic, ± 5%
C26-C28, C33, C34, C39	770207	Capacitor, 10µF/16V, Radial, Electric, ± 20%
C29	736112	Capacitor, 1µF/50V, Radial, Electric
C31, C32, C43, C44, C135	700365	Capacitor, 30pF/100V, Axial, Ceramic, ± 5%
C35, C36	700360	Capacitor, 20pF/100V, Axial, Ceramic, ± 5%
C37, C38	736101	Capacitor, 47µF/25V, Radial, Electric, ± 20%
C49-C56	700368	Capacitor, 1000pF/100V, Axial, Ceramic, ± 20%
C101	736300	Capacitor, .1µF/100V, Radial, Poly Film, ± 10%
C102	730024	Capacitor, 2200µF/50V, Radial, Electric
C103	741575	Capacitor, 390pF/100V, Axial, Ceramic, ± 5%
C104	730022	Capacitor, 3300µF/25V, Radial, Electric, ± 20%
C107	730033	Capacitor, 1000µF/6.3V, Radial, Electric
C133	741576	Capacitor, 270pF/100V, Axial, Ceramic, ± 5%
CR2	793352	Diode with Bead on Lead, 3 Amp, 50V, Schottky, MBR 350
CR3	760479	Diode, 3 Amp, 50V, Schottky, MBR 350
CR4-CR8, CR18-CR20	709100	Diode, Switch, 100V, 1N914
CR9	700521	Diode, Rectifier, 50V, 1N4001
CR10, CR14-CR17	722058	Diode, 1 Amp, Fast Recovery, 1N4933
F1	793050	Pico Fuse, 2A, 125V, Slo-Blo
F3	735780	Fuse, .6A, 250V, Slo-Blo
J1	723357	Header, Lock Post, 2 Position, .156
J3	783579	Connector, Right Angle, .110
J5	770152	Connector, .100, 18 Position Flex Cable
L1, L2	783573	Inductor, Axial, 80µH, 6 Amp
LS1 (Beeper)	728783	Audio Transducer, 12V
Q1	591041	MOSFET, P-Channel, 50V, IRF9Z20
Q2, Q3, Q11, Q13, Q14	702518	Transistor, NPN, .2 Amp, Switching, 2N3904
Q4, Q12	703714	Transistor, PNP, .2 Amp, Switching, 2N3906
Q6	736604	Transistor, PNP, 1.5 Amp, MPS750
Q7	743086	Transistor, NPN, 4 Amp, Darlington, 2N6039

REF	PART NUMBER	PART NAME
R2	760450	Resistor, 470 Ω, 1W, 5%
R3	760455	Resistor, 680 Ω, 1W, 5%
R4	748289	Resistor, 137 K Ω, 1/4W, 1%
R5	748290	Resistor, 10.2 K Ω, 1/4W, 1%
R6	773130	Resistor, .1 Ω, 1W, 5%, Wire Wound
R7, R22, R23, R25-R28, R151, R154, R155, R169	701254	Resistor, 1 K Ω, 1/4W, 5%
R8-R15, R19, R30, R44	701287	Resistor, 39 K Ω, 1/4W, 5%
R16, R18, R33, R37, R43	701252	Resistor, 220 Ω, 1/4W, 5%
R17, R54, R171, R172,	746938	Resistor, 390 Ω, 1/4W, 5%
R20, R21, R166, R167	701253	Resistor, 270 Ω, 1/4W, 5%
R24	748227	Resistor, 220 K Ω, 1/4W, 5%
R29, R55, R63, R147, R148	701268	Resistor, 10 K Ω, 1/4W, 5%
R34	765833	Resistor, 1.3 K Ω, 1/2W, 5%, 1/4W Package
R35	701280	Resistor, 1.8 K Ω, 1/4W, 5%
R36	781501	Resistor, 220 Ω, 2W, 5%
R56-R60	701271	Resistor, 470 Ω, 1/4W, 5%
R64, R159	771008	Resistor, 1 M Ω, 1/8W, 5%
R146, R149, R150	781513	Resistor, 6.8 Ω, 3W, 5%, 2W Package
R152, R156, R165	748225	Resistor, 11 Ω, 1/4W, 5%
R153, R160, R168, R170	748245	Resistor, 39 Ω, 1/4W, 5%
R157	701255	Resistor, 2 K Ω, 1/4W, 5%
R158	771009	Resistor, 1 K Ω, 1/8W, 5%
R161	701299	Resistor, 8.2 K Ω, 1/4W, 5%
R162	701270	Resistor, 47 K Ω, 1/4W, 5%
R173	701266	Resistor, 100 Ω, 1/4W, 5%
R174-R177	771001	Resistor, 390 Ω, 1/8W, 5%
SC1	781910	Mounting Screw
SP1-SP62, SP72-SP83	748858	Stake Pin, .025 Square
U1	782900	IC, Power Supply Controller, MC34063A
U2	769449	IC, Power Switching Regulator, 3 Amp, 34163
U3	788114	IC, Microprocessor, 8052 AH, Slave
U4	724700	IC, Hex Inverter, Open Collector, 7406
U5-U7	781722	IC, Quad Driver, w/Inverters, L-6220
U8	709683	IC, Quad 2 Input And Gate, 74LS08
U11	788096	IC, 2 Meg EPROM, Master & Dictionary, 5FCN, 5FDL, USA
U11	788112	IC, 2 Meg EPROM, Master & Dictionary, 5FER, USA
U11	788098	IC, 2 Meg EPROM, Master, 5FES, 5FCP, 5FDM, USA
U15, U16	760511	IC, 64 K x 8 Dynamic RAM, 4164
U19	769360	IC, Floppy Disk Controller, MCS3201
U20	752400	IC, Microprocessor, 8032 AH, Master
U46	788161	IC, 1 Meg EPROM, Dictionary, 5FES, 5FCP, 5FDM, USA
U47	769530	IC, Quad H Driver, L293B
U49	795010	IC, ASIC, Disk Drive/LCD Controller, 84 Pin
VI1	725119	Vinyl Insulator
VR1	781951	Diode, Zener, 12V, .5W, 1N5242
VR3	765829	Diode, Zener, 2.4V, .5W, 1N5221
VR4	791024	Diode, Zener, 13V, .5W, 1N5243B, 5FEN, 5FER, 5FCN, 5FDL
VR4	769410	Diode, Zener, 14V, .5W, 1N5244B, 5FEQ, 5FES, 5FCP, 5FDM
W1, W2, F2	705294	Jumper Wire
WS1	781628	Insulation Bushing
Y5	769366	Crystal, Quartz, 24 MHz, 3 Pin
Y6	736950	Resonator, Ceramic, 12 Mhz
Y7	769354	Crystal, Quartz, 24 MHz, 2 Pin

CONTROL P.C. BOARD
COMPONENT LISTING
5FEN, 5FEQ, 5FER, 5FES,
5FCN, 5FCP, 5FDL, 5FDM
(WITH ASIC)

P/N 790281—USA (5FCN, 5FDL)
790288—USA (5FER)
790290—USA (5FES, 5FCP, 5FDM)
790297—INTERNATIONAL (5FEN, 5FEQ, 5FER, 5FES, 5FCN)

SC1, VI1, AND WS1 ARE
USED FOR MOUNTING HEAT
SINK TO TRANSISTOR Q1

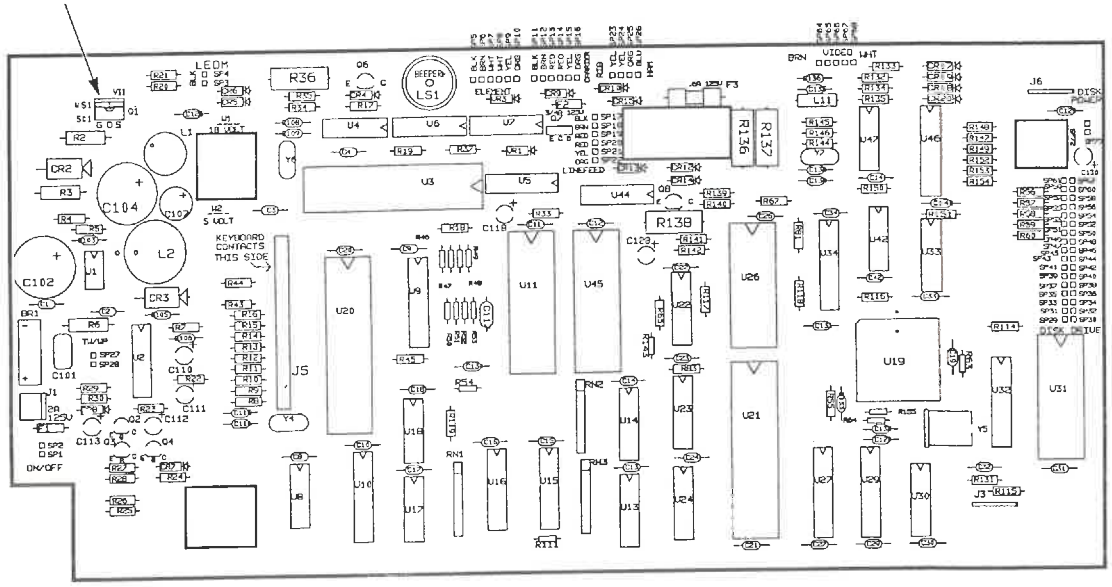


COMPONENT	PART NUMBER	DESCRIPTION
International		
F2	793051	Pico Fuse, .75A, 125V, Slo-Blo (230V/50Hz and 240V/50Hz machines only)
U11	788154	IC, 2 Meg EPROM, Master, 5FEN, 5FCN, Canada
U11	788155	IC, 2 Meg EPROM, Master, 5FER, Canada
U11	788156	IC, 2 Meg EPROM, Master, 5FES, Canada
U11	788164	IC, 2 Meg EPROM, Master, 5FER, UK, Australia
U11	788166	IC, 2 Meg EPROM, Master, 5FES, UK, Australia
U11	788148	IC, 2 Meg EPROM, Master, 5FEQ, Spanish American
U11	788149	IC, 2 Meg EPROM, Master, 5FEQ, France
U11	788150	IC, 2 Meg EPROM, Master, 5FEQ, Germany
U11	788151	IC, 2 Meg EPROM, Master, 5FEQ, Holland
U11	788152	IC, 2 Meg EPROM, Master, 5FEQ, Spain
U46	788012	IC, 2 Meg ROM, Dictionary, 5FEN, 5FER, 5FES, 5FCN, Canada
U46	788165	IC, 2 Meg ROM, Dictionary, 5FER, 5FES, UK, Australia
U46	788013	IC, 2 Meg ROM, Dictionary, 5FEQ, Spanish American
U46	788157	IC, 4 Meg ROM, Dictionary, 5FEQ, France
U46	788158	IC, 4 Meg ROM, Dictionary, 5FEQ, Germany
U46	788159	IC, 4 Meg ROM, Dictionary, 5FEQ, Holland
U46	788160	IC, 4 Meg ROM, Dictionary, 5FEQ, Spain

CONTROL P.C. BOARD
COMPONENT LISTING
5FEL, 5FCL, 5FDK,
5FWK, 5FHF

P/N 793715—USA

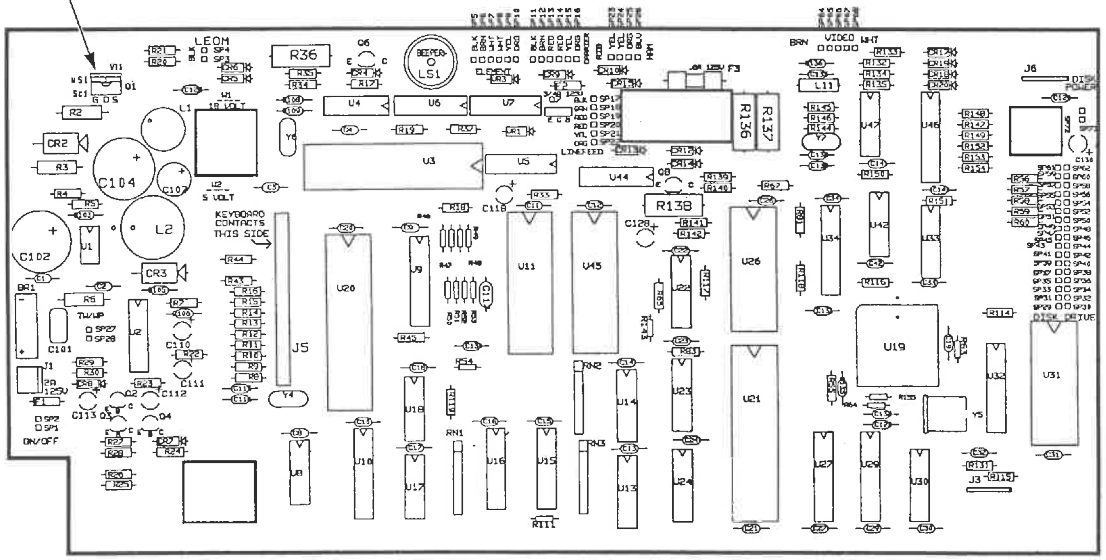
SC1, VI1, AND WS1 ARE
USED FOR MOUNTING HEAT
SINK TO TRANSISTOR Q1



CONTROL P.C. BOARD
COMPONENT LISTING
5FEL, 5FCL, 5FDK,
5FWK, 5FHF

P/N 793715—USA

SC1, VI1, AND WS1 ARE
USED FOR MOUNTING HEAT
SINK TO TRANSISTOR Q1

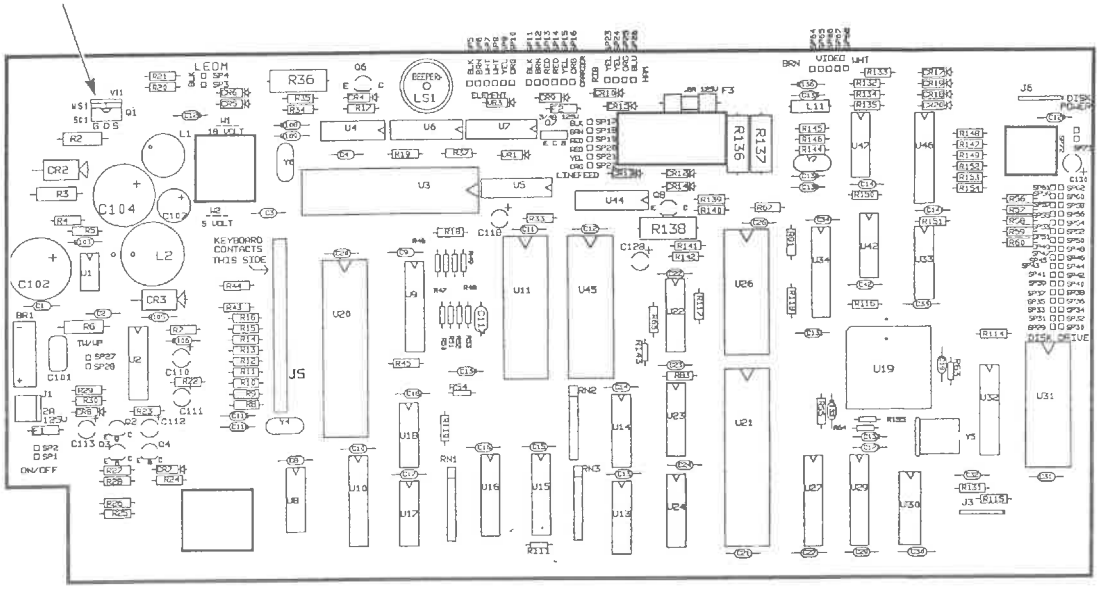


COMPONENT	PART NUMBER	DESCRIPTION
R2	760450	Resistor, 470 Ω, 1W, 5%
R3	760455	Resistor, 680 Ω, 1W, 5%
R4	748289	Resistor, 137 K Ω, 1/4W, 1%
R5	748290	Resistor, 10.2 K Ω, 1/4W, 1%
R6	773130	Resistor, .1 Ω, 1W, 5%, Wire Wound
R7, R22, R23, R25-R28, R144	701254	Resistor, 1 K Ω, 1/4W, 5%
R8-R15, R19, R30, R44	701287	Resistor, 39 K Ω, 1/4W, 5%
R16, R18, R33, R37, R43, R65, R81, R114-R118, R151	701252	Resistor, 220 Ω, 1/4W, 5%
R17	701284	Resistor, 330 Ω, 1/4W, 5%
R20, R21	701253	Resistor, 270 Ω, 1/4W, 5%
R24	748227	Resistor, 220 K Ω, 1/4W, 5%
R29, R55, R83, R139-R142	701268	Resistor, 10 K Ω, 1/4W, 5%
R34	765833	Resistor, 1.3 K Ω, 1/2W, 5%, 1/4W Package
R35	701280	Resistor, 1.8 K Ω, 1/4W, 5%
R36	781501	Resistor, 220 Ω, 2W, 5%
R45, R56-R60	701271	Resistor, 470 Ω, 1/4W, 5%
R46-R54, R63, R111, R143	771001	Resistor, 390 Ω, 1/8W, 5%
R64	771008	Resistor, 1 M Ω, 1/8W, 5%
R67, R131	701279	Resistor, 3 K Ω, 1/4W, 5%
R119, R146	701274	Resistor, 33 Ω, 1/4W, 5%
R132-R134	748225	Resistor, 11 Ω, 1/4W, 5%
R135	701250	Resistor, 22 Ω, 1/4W, 5%
R136-R138	781513	Resistor, 6.8 Ω, 3W, 5%, 2W Package
R145	701269	Resistor, 1 M Ω, 1/4W, 5%
R147-R149, R152-R154	746938	Resistor, 390 Ω, 1/4W, 5%
R150	701266	Resistor, 100 Ω, 1/4W, 5%
R155	771009	Resistor, 1 K Ω, 1/8W, 5%
RN1-RN3	950616	Resistor Network, 390 Ω, 1/8W, 8 Pins
SC1	781910	Mounting Screw
SP1-SP62, SP64-SP68, SP72, SP73	748858	Stake Pin, .025 Square

CONTROL P.C. BOARD
COMPONENT LISTING
5FEL, 5FCL, 5FDK,
5FWK, 5FHF

P/N 793715—USA

SC1, VI1, AND WS1 ARE USED FOR MOUNTING HEAT SINK TO TRANSISTOR Q1



COMPONENT	PART NUMBER	DESCRIPTION
U1	782900	IC, Power Supply Controller, MC34063A
U2	769449	IC, Power Switching Regulator, 3 Amp, 34163
U3	786992	IC, Microprocessor, 8052 AH, Slave
U4	724700	IC, Hex Inverter, Open Collector, 7406
U5-U7	781722	IC, Quad Driver, w/Inverters, L-6220
U8, U18	709683	IC, Quad 2 Input And Gate, 74LS08
U9	709684	IC, Tri-State Octal Latch, 74LS373
U10	786854	IC, Logic Array, 35 ns, PAL16L8A
U11	786980	IC, 2 Meg ROM, Master, USA
U13, U14, U22-U24	760020	IC, Quad 2 to 1 Selector, 74LS157
U15, U16	760511	IC, 64 K x 8 Dynamic RAM, 4164
U17	705236	IC, Hex Inverter, 74LS04
U19	769360	IC, Floppy Disk Controller, MCS3201
U20	752400	IC, Microprocessor, 8032 AH, Master
U21	765887	IC, CRT Controller, 6845
U26	781912	IC, CMOS, 8 K x 8 Static RAM, 6264
U27	706964	IC, Octal Buffer/Driver, 74LS244
U29, U32, U34	910261	IC, Octal D-Flip Flop, 74F273
U30	910264	IC, Quad D-Flip Flop, 74F175
U33	910266	IC, 8 to 1 Multiplexer, 74F151
U42	769570	IC, Hex Inverter, 74F04
U44	769530	IC, Quad H Driver, L293B
U45	788161	IC, 1 Meg ROM, Dictionary, USA
U46	788167	IC, Logic Array, PALCE16V8
U47	760814	IC, Hex Inverter, 74HCU04
VI1	725119	Vinyl Insulator
VR1	781951	Diode, Zener, 12V, .5W, 1N5242
VR3	765829	Diode, Zener, 2.4V, .5W, 1N5221
W1, W2, F2	705294	Jumper Wire
WS1	781628	Insulation Bushing
Y4, Y6	736950	Resonator, Ceramic, 12 Mhz
Y5	769366	Crystal, Quartz, 24 MHz, 3 Pin
Y7	736956	Resonator, Ceramic, 18 MHz

Numerical Part Number/ Page Number Listing

105090	11	701280	28	730022	33	743086	27	752400	35
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591166	5	702518	30	735780	27	747258	11	760450	34
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769530	35	771008	31	777939	7	781910	18	783579	33
769545	20	771008	34	778281	7	781910	19	783836	13
769570	35	771009	31	778281	8	781910	20	783888	18
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769671	4	771461	16	778805	7	781910	34	786246	26
769672	4	771462	16	778807	7	781912	25	786413	26
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770152	27	771930	16	779186	8	782425	17	788026	26
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770152	33	772118	2	779188	8	782616	25	788028	26
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770282	15	774461	4	780411	9	783093	2	788114	31
770288	14	774481	4	780424	2	783093	3	788148	32
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788158	32	791723	4	793186	3	796707	15		
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791557	5	793035	3	795243	4	910968	18		
791558	4	793050	24	795246	3	910983	19		
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791648	4	793153	3	796269	9	950676	17		
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SMITH CORONA

5A SERIES
VERSION 2 MODELS

USA

SL 480 (5ACM)
MARK 100 (5AWN)
DEVILLE 470 (5AKL)
250 DLE (5ADL)

INTERNATIONAL

XL 1850 (5AES)
SL 470 (5ACR)
XE 1630 (5ALE)
CX 380 (5ALF)

PARTS MANUAL

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PREFACE

This Parts Manual lists and illustrates parts and electronic components necessary for the maintenance of the following Smith Corona 5A Series Version 2 typewriters.

SMALL JACKET MODELS

Model Name	Model Prefix	Jacket Color	Model Name	Model Prefix	Jacket Color
SL 470	5ACR	Silver Fog	250 DLE	5ADL	Silver Ash
SL 480	5ACM	Silver Fog	XE 1630	5ALE	Silver Ash
Mark 100	5AWN	Silver Ash	XL 1850	5AES	Silver Ash
Deville 470	5AKL	Silver Fog	CX 380	5ALF	Silver Fog

Unique International parts are listed separately on each page where applicable.

A Reference Number is used on parts illustrations, and a Component Number is used for each Component on the Control PC Board diagrams. The number is listed numerically in the parts listing beneath the illustration or diagram, and refers directly to the part number.

When an illustrated part has variations in appearance, color, voltage, etc., the reference number appears more than once in the "REF" or "COMPONENT" column. Use extreme care in selecting parts in these areas.

If the part number is known, the page on which it is listed can readily be found by reference to the numerical parts listing at the end of the Manual.

Parts Ordering Instructions: State the correct part number on all parts orders. State additional information if asked for. It is not necessary to state the part name unless the part number is not known. Do not order by reference numbers.

PC Board Repair: Smith Corona encourages PC Board repair by qualified technicians. If, however, after trying to repair a PC Board, the Board still does not work properly, return the Board to Smith Corona National Service Stores for warranty or repair exchange.

Important: Smith Corona does not replace or exchange damaged PC Boards (in or out of warranty).

Boards will be returned as irreparable and no credits or exchanges issued when:

- There are missing components;
- There are damaged or lifted traces;
- There are solder burns;
- There is any other Board damage which makes the Board irreparable.

Smith Corona reserves the right to discontinue parts at any time and/or to furnish substitutes.

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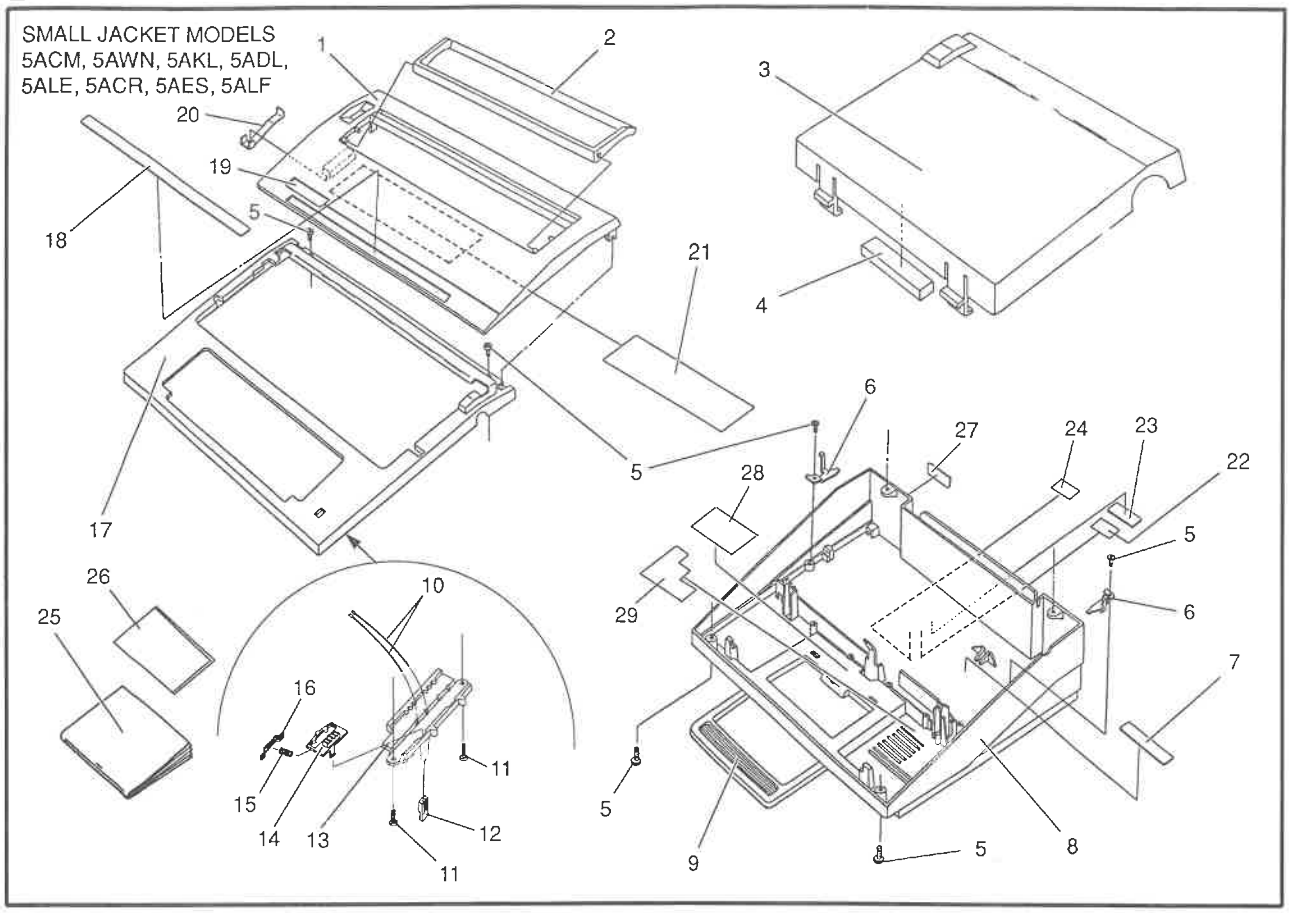
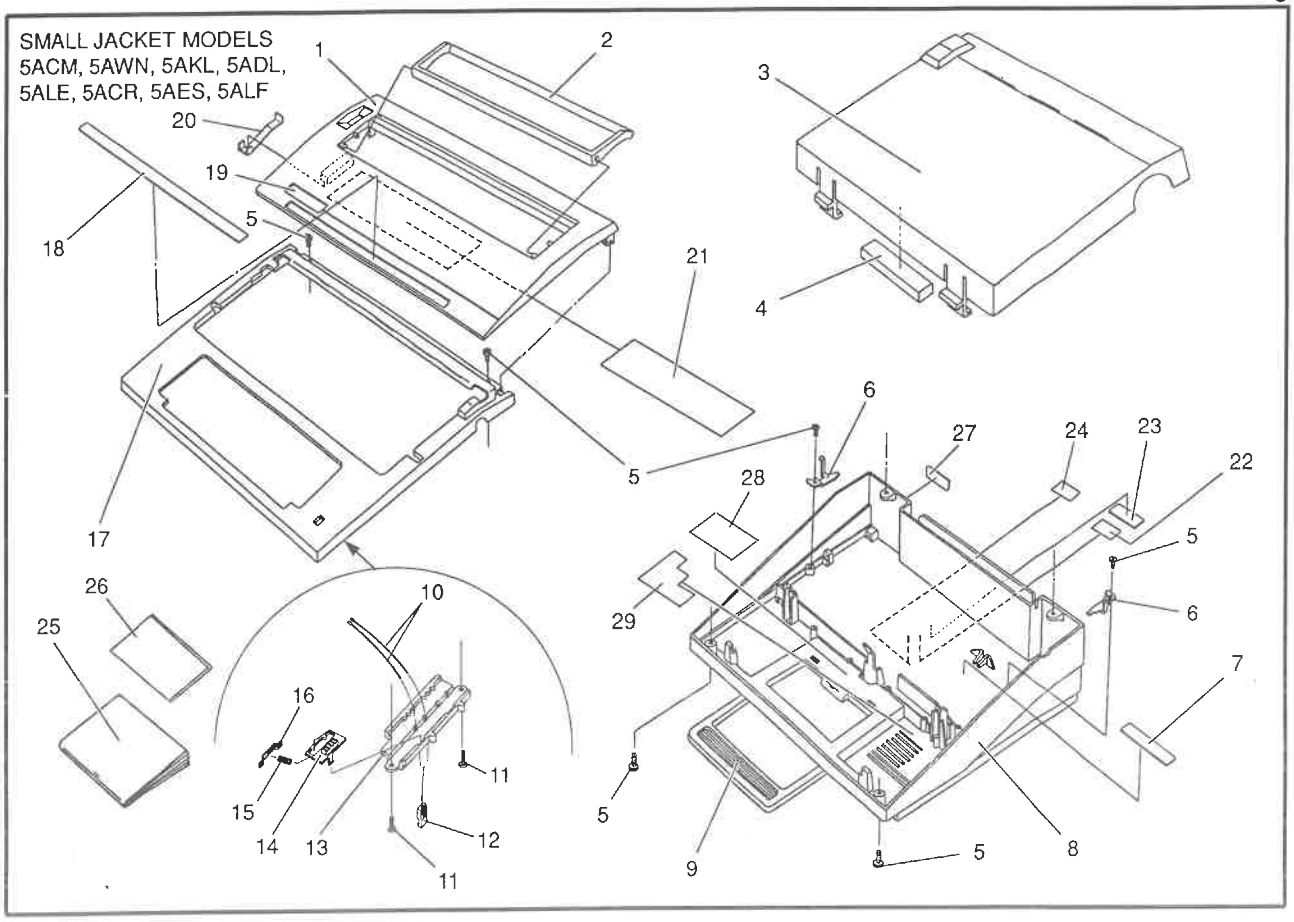
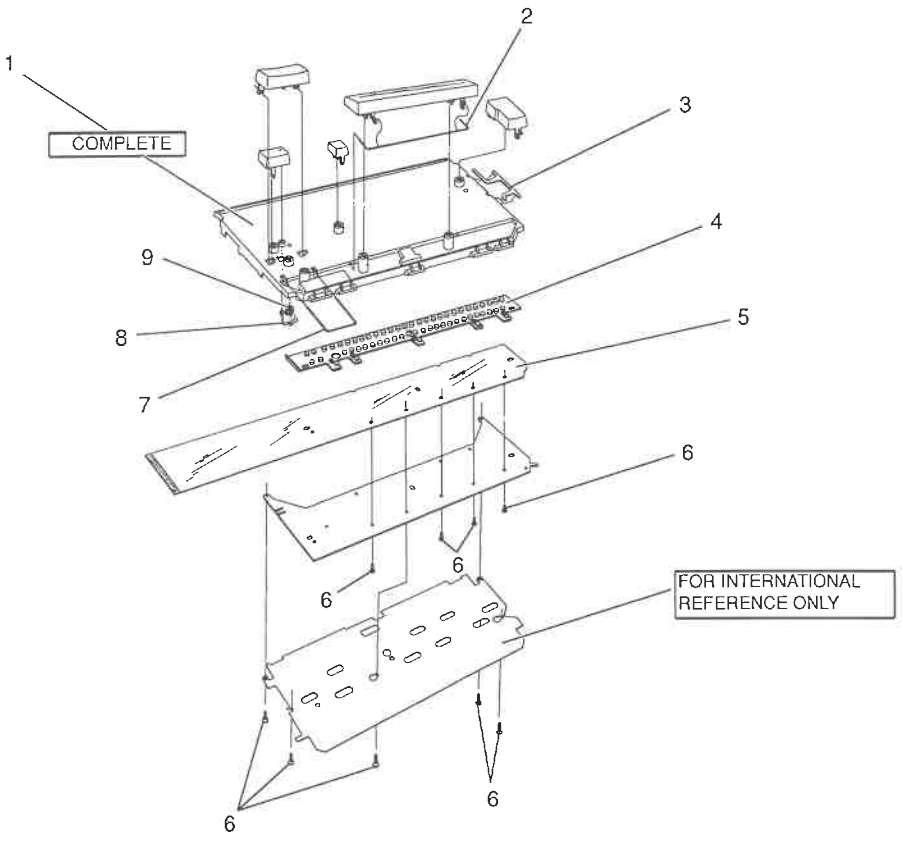


REF	PART NUMBER	PART NAME	QTY
1	796410	Deck, w/Ref 19, Silver Fog, SL 480	1
1	796412	Deck, w/Ref 19, Silver Fog, Deville 470	1
1	796413	Deck, w/Ref 19, Silver Ash, Mark 100	1
1	796414	Deck, w/Ref 19, Silver Ash, 250 DLE	1
2	784122	Paper Bail, Black, 5ACM, 5AKL, 5ACR	1
2	784124	Paper Bail, Silver Ash, 5AWN, 5ADL	1
3	777310	Casing Lid, w/Ref 4, Silver Fog, Models 5ACM, 5AKL	1
3	777312	Casing Lid, w/Ref 4, Silver Ash, Models 5AWN, 5ADL	1
4	777244	Foam, 1/2" thick	1
5	747258	Screw	6
6	770829	Foot Retainer	2
7	794811	Label, Cassette Position/Warning, USA & Canada	1
8	796341	Casing Base, Silver Fog, HB, Models 5ACM, 5AKL	1
8	796343	Casing Base, Silver Ash, HB, Models 5AWN, 5AES	1
8	796345	Casing Base, Silver Ash, VO, 5ADL, 5ALE	1
9	748919	Casing Base Handle, Silver Fog, Models 5ACR, 5ACM, 5AKL	1
9	774032	Casing Base Handle, Silver Ash, Models 5AWN, 5ADL, 5ALE	1
10	776575	Electric Lead, w/Splice Band	2
11	770672	Screw	2
12	751067	Connector, 2 Position	1
13	776602	Switch Actuator Plate	1
14	776748	Switch Actuator, Silver Ash	1
15	776599	Spring, Compression	1
16	776601	Sliding Contact	1
17	776610	Mask, Silver Ash, HB, 5AWN, 5ADL	1
17	776611	Mask, Silver Fog, HB, Models 5ACM, 5AKL, 5ACR	1
18	796380	Deck Overlay, Silver Fog, Models 5ACM, 5AKL, 5ACR	1
18	796381	Deck Overlay, Silver Ash, Models 5AWN, 5AKL, 5ADL	1
19	729572	Deck Nameplate	1
20	771910	Paper Bail Detent	1
21	794812	Label, Packing/Unpacking	1
22	772118	Patent Numbers Label, All Models	1
		Electrical Rating Labels	
23	774451	Label, Electrical Rating, USA	1
23	774452	Label, Electrical Rating, 5ACR, Fr/Can	1
23	774489	Label, Electrical Rating, 5ACR, 5ALF, UK, Australia	1
23	774491	Label, Electrical Rating, 5ALE, UK	1
23	774494	Label, Electrical Rating, 5AES Germany, Holland, Spain, France	1
23	774499	Label, Electrical Rating, 5AES, Sweden, Denmark	1
24	795000	Label, FCC, USA	1



REF	PART NUMBER	PART NAME	QTY
25	798200	Owner's Manual, USA	1
25	798201	Owner's Manual, 5ACR, 5ALE, UK, Australia	1
25	798202	Owner's Manual, English/Canada, 5ACR	1
25	798203	Owner's Manual, French/Canada, 5ACR	1
25	798205	Owner's Manual, 5AES, France	1
25	798206	Owner's Manual, 5AES, Sweden	1
25	798208	Owner's Manual, 5AES, Spain	1
25	798210	Owner's Manual, 5AES, Holland	1
25	798204	Owner's Manual, 5AES, German	1
25	798310	Owner's Manual, 5AES, Denmark	1
		Unique International Parts	
1	796411	Deck, w/Ref 19, Silver Fog, VO, Model SL 470, UK, Australia	1
1	796425	Deck, w/Ref 19, Silver Fog, SL 470, French/Canada	1
1	796428	Deck, w/Ref 19, Silver Ash, VO, Model XE 1630, UK	1
1	796930	Deck, w/Ref 19, Silver Ash, HB, Model XL 1850, Germany	1
1	796931	Deck, w/Ref 19, Silver Ash, HB, Model XL 1850, France	1
1	796932	Deck, w/Ref 19, Silver Ash, HB, Model XL 1850, Spain	1
1	796933	Deck, w/Ref 19, Silver Ash, HB, Model XL 1850, Holland, Denmark, Sweden	1
1	796948	Deck w/Ref 19, Silver Fog, VO, Model CX 380, UK	1
2	784123	Paper Bail, Black, VO, 5ACR, 5ALF UK, Australia	1
2	784124	Paper Bail, Silver Ash, HB, 5AES	1
2	784125	Paper Bail, Silver Ash, VO, 5ALE, UK	1
3	777310	Casing Lid, w/Ref 4, Silver Fog, Models 5ACR, Canada, Australia	1
3	777312	Casing Lid, w/Ref 4, Silver Ash, Models 5AES, 5ALE, UK	1
3	777806	Casing Lid, W/Ref 4, Silver Fog, Models 5ACR, 5ALF, UK	1
7	794811	Label, Cassette Position/Warning, UK, Aust.	1
7	794820	Label, Cassette Position/Warning, Germany, Holland, Spain, France, Sweden, Denmark	1
8	796341	Casing Base, Silver Fog, HB, 5ACR, Canada	1
8	796342	Casing Base, Silver Fog, VO, 5ACR, 5ALF, UK, Australia	2
9	748919	Casing Base Handle, Silver Fog, UK, Aust.	1
9	774032	Casing Base Handle, Silver Ash, UK	1
14	776744	Switch Actuator, Silver Ash, UK	1
17	776610	Mask, Silver Ash, HB, 5AES	1
17	777420	Mask, Silver Ash, VO, 5ALE, UK	1
17	777421	Mask, Silver Fog, VO, 5ACR, 5ALF, UK, Australia	1
18	796380	Deck Overlay, Silver Fog, 5ACR, 5ALF, UK, Australia	1
18	796381	Deck Overlay, Silver Ash, 5ACR, 5ALE, United Kingdom	1
18	796385	Deck Overlay, Silver Ash, 5AES, German	1
18	786386	Deck Overlay, Silver Ash, 5AES, France	1
18	796387	Deck Overlay, Silver Ash, 5AES, Spain	1
18	796388	Deck Overlay, Silver Ash, 5AES, Holland, Denmark, Sweden	1
21	794812	Label, Packing/Unpacking, Canada, UK, Aust.	1
21	794819	Label, Packing/Unpacking, Germany, Holland, Spain, France, Denmark	1
26	792236	Flyer, Safety Recommendation, UK	1
26	798357	Flyer, CX 380, 5ALF, UK	1
27	771446	Label, Country of Origin, UK	1
28	700803	Insulator Shield	1
29	700804	Insulator Shield, Interim	1

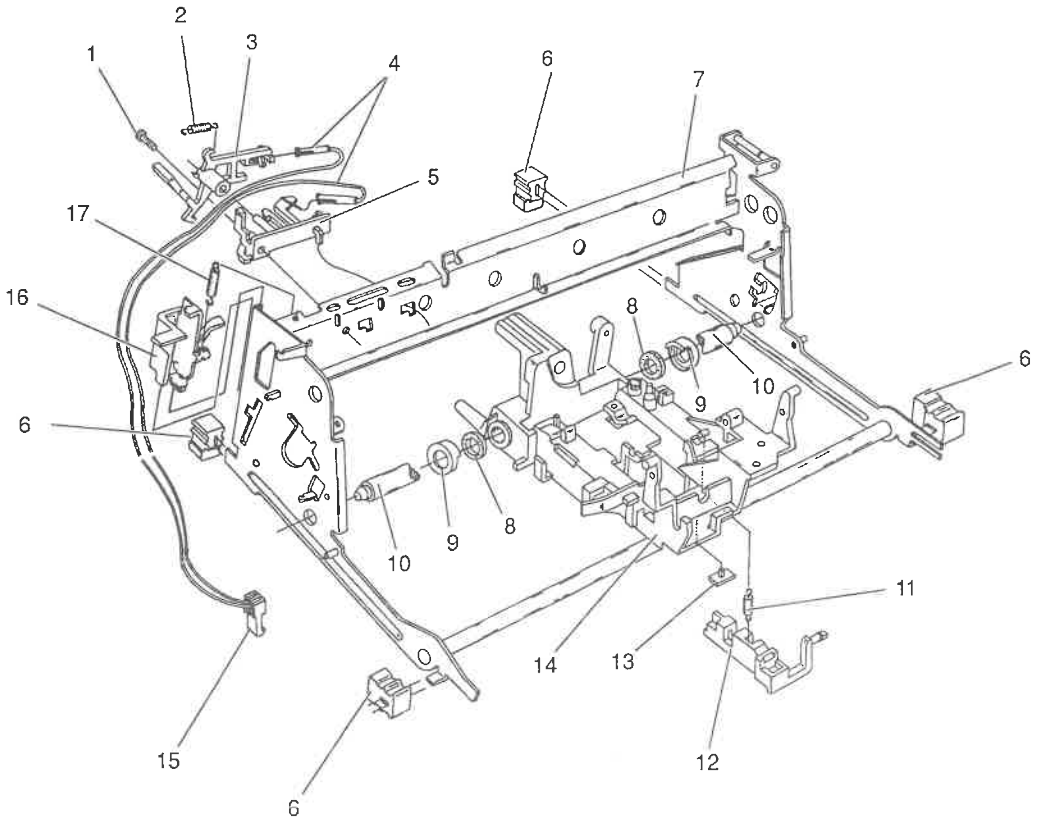
KEYBOARD



REF	PART NUMBER	PART NAME	QTY
		USA Keyboard	
1	777925	Keyboard Complete, Models 5ACM, 5AWN, 5AKL, 5ADL	1
2	778281	Spacebar Bail	1
3	778815	Return Bail	1
4	778814	Molded Switches	1
5	778805	Flexible Circuits	1
6	778807	Self Tap Screw	12
7	778282	Left Shift Bail	1
8	778316	LED, Green	1
9	778347	LED Contact Washer	1

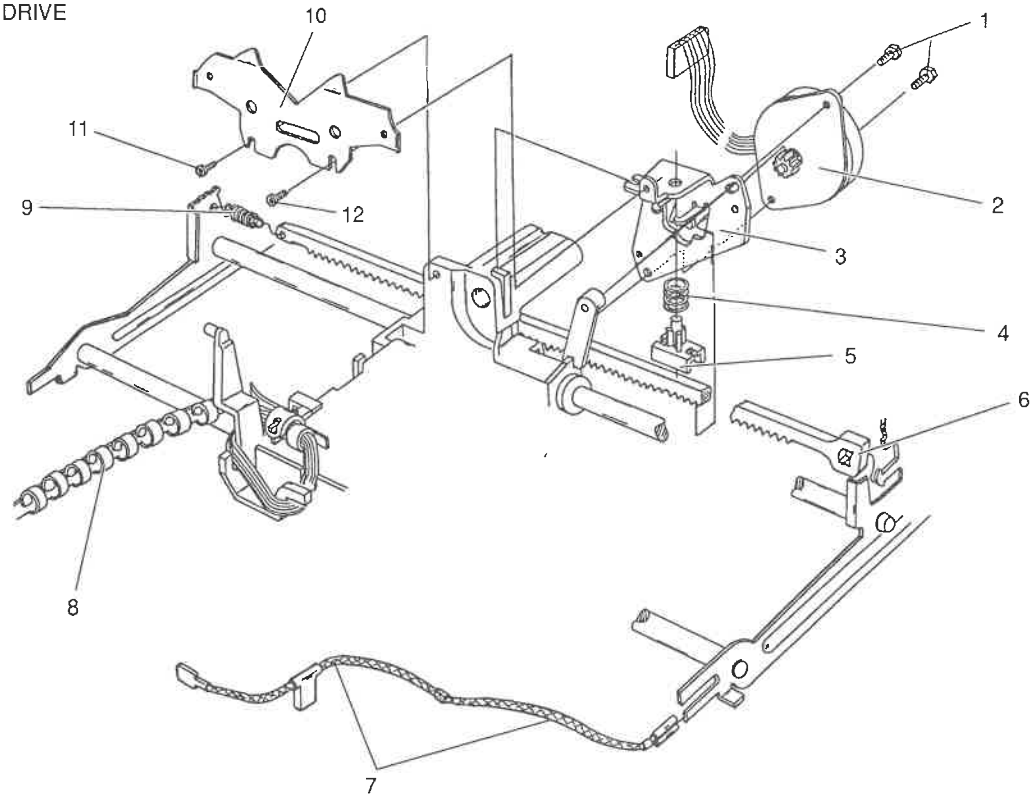
REF	PART NUMBER	PART NAME	QTY
		International Keyboards	
1	777926	Keyboard Complete, 5ACR, Canada	1
1	779384	Keyboard Complete, Models 5ACR, 5ALF, 5ALE, UK, Australia	1
1	777929	Keyboard Complete, 5AES, Germany	1
1	777943	Keyboard Complete, 5AES, Denmark	1
1	777944	Keyboard Complete, 5AES, France	1
1	777945	Keyboard Complete, 5AES, Holland	1
1	777946	Keyboard Complete, 5AES, Spain	1
1	777947	Keyboard Complete, 5AES, Sweden	1

CARRIER MOLDING, RAILS, AND FRAMES



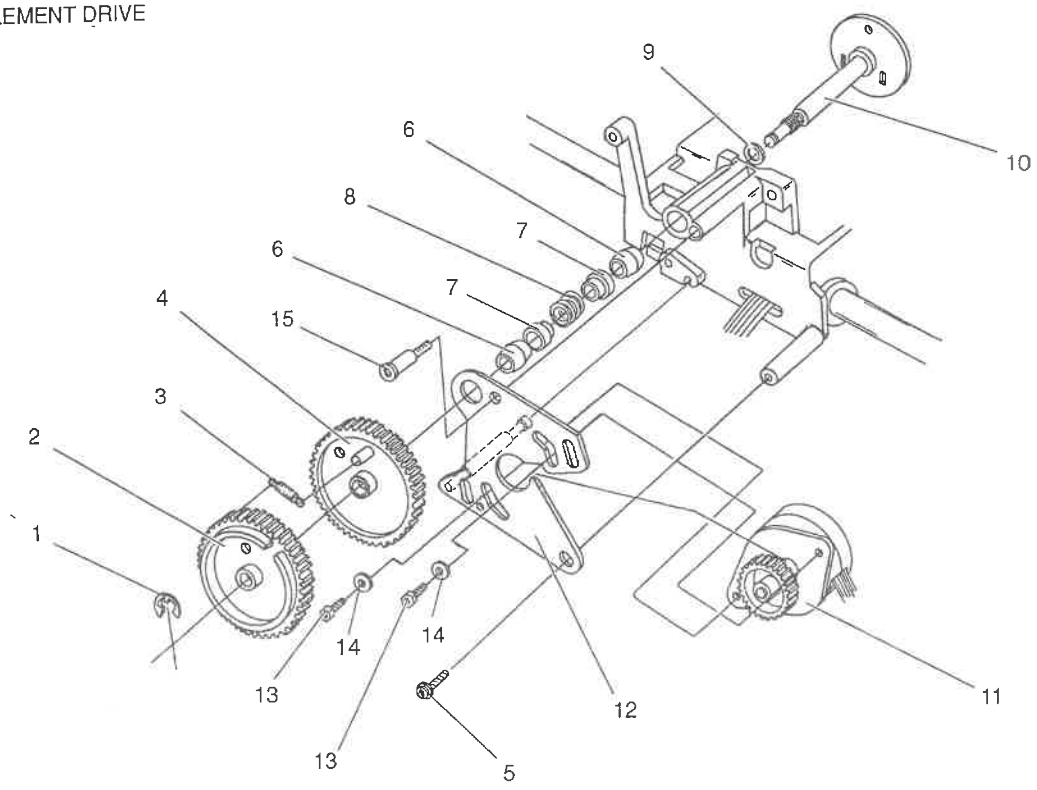
REF	PART NUMBER	PART NAME	QTY
1	783194	Self Tap Screw	1
2	133250	Spring	1
3	783190	Left End Switch Latch	1
4	775217	Left End Switch Assembly, w/Ref 15, All Small Jacket Models	1
5	783191	Left End Switch Bracket	1
6	777305	Foot, Front & Rear	4
7	796296	Frame Assembly Complete	1
8	740084	Wiper	2
9	740257	Wiper Retainer	2
10	771427	Rear Carrier Shaft	1
11	771617	Spring	1
12	776571	Carrier Restraint	1
13	780411	Slider	1
14	776577	Molded Carrier, w/Ref 13	1
15	736900	Connector, 2 Pin	1
16	796300	Actuator	1
17	771271	Spring	1

CARRIER DRIVE



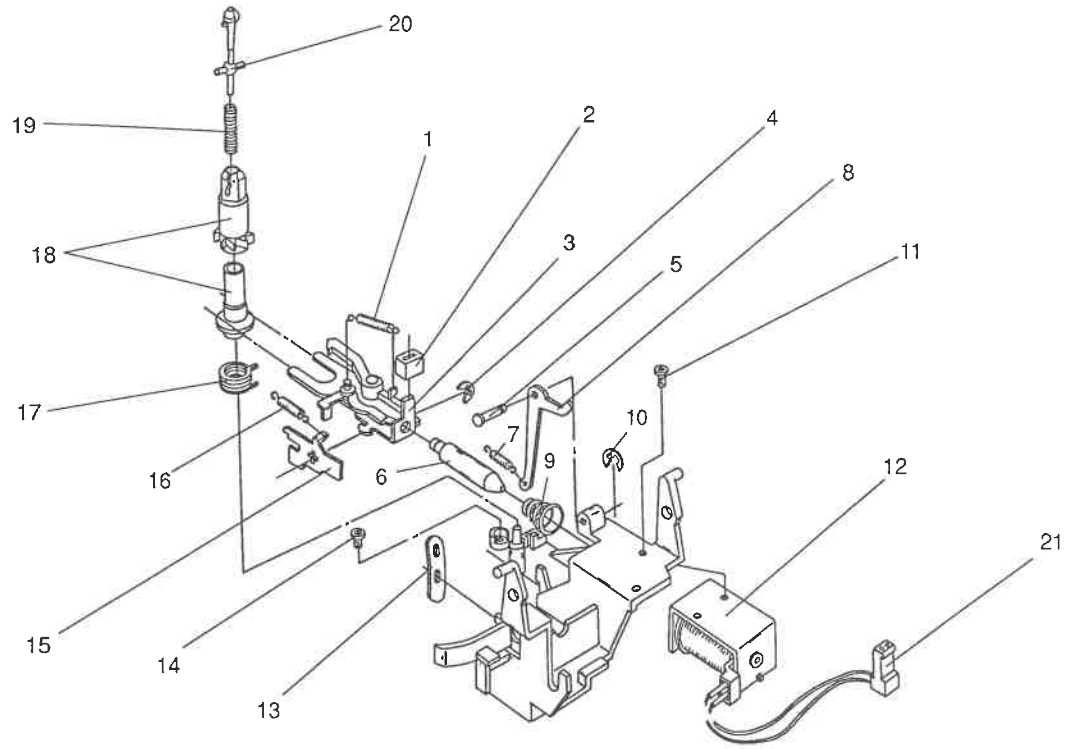
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	747258	Carrier Motor Screw	2	8	770317	Wire Binder Retainer	1
2	774860	Carrier Motor Assembly	1	9	768661	Spring	1
3	777307	Carrier Return Bracket	1	10	901212	Line Indicator	1
4	751719	Spring	1	11	770672	Self Tap Screw	1
5	768671	Anti-Backlash Slider	1	12	781910	Screw	1
6	768669	Carrier Drive Rack	1				
7	782418	Ground Cable Assembly, Small Jacket Models Only	1				

ELEMENT DRIVE



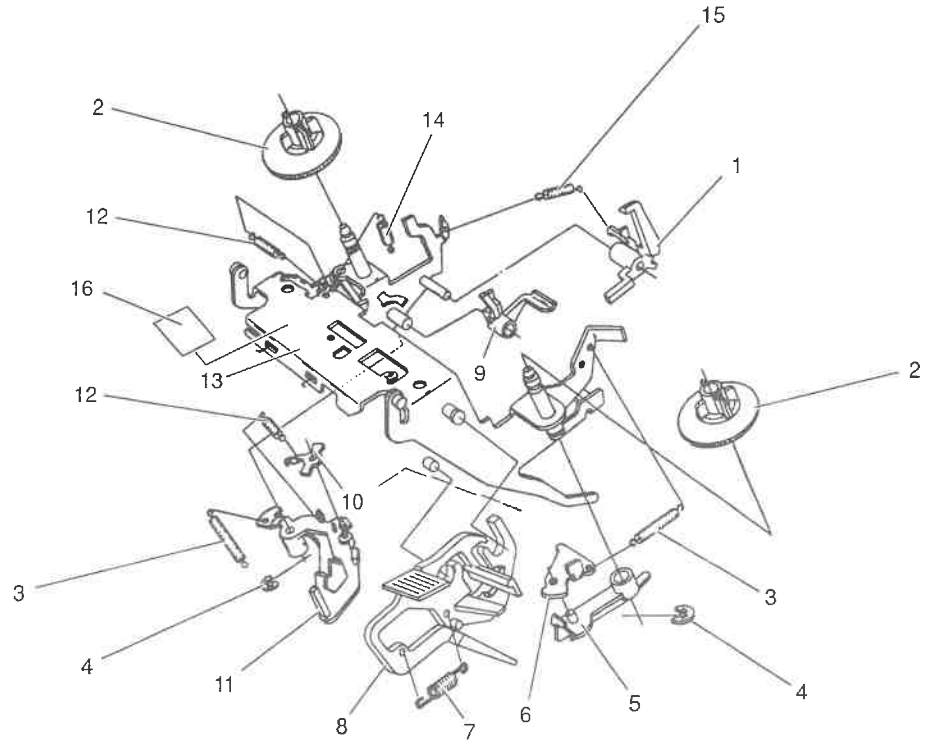
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	467980	E-Ring	1	9	752735	Thrust Washer	1
2	749965	Outside Gear Spring	1	10	740004	Element Drive Shaft	1
3	771260	Element Gear Spring	1	11	774870	Element Motor	1
4	745321	Inside Scissor Gear	1	12	790001	Element Motor Plate	1
5	747258	Self Tap Screw	1	13	770297	Screw	2
6	740143	Bearing	2	14	105090	Flat Washer	2
7	752734	Bearing Retainer	2	15	790008	Shoulder Screw	1
8	782619	Spring	1				

RIBBON DRIVE



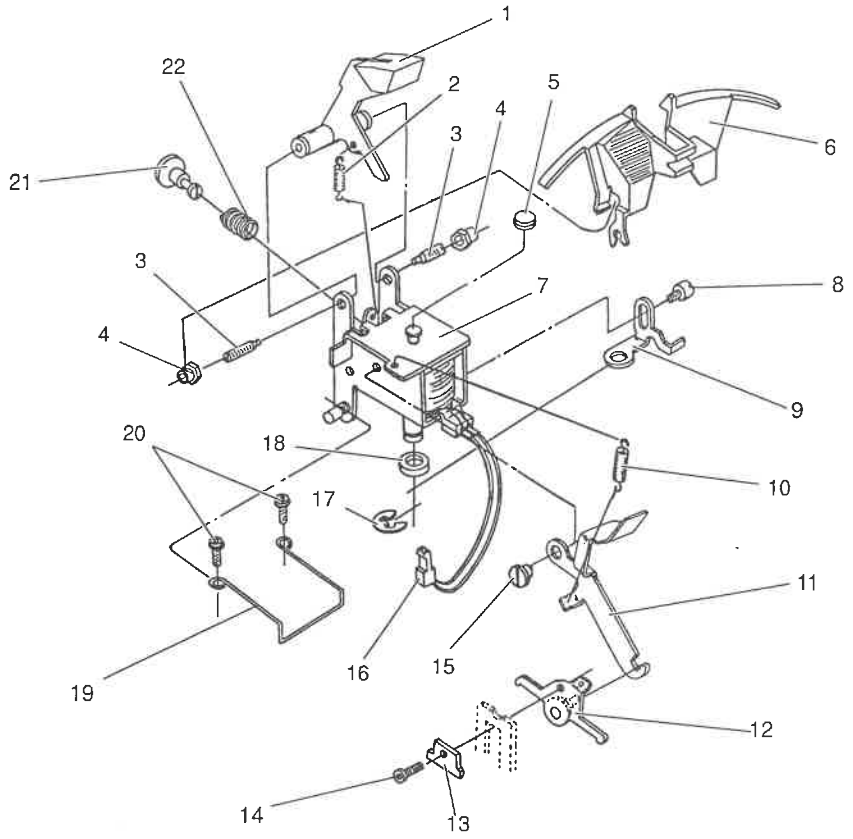
REF	PART NUMBER	PART NAME	QTY
1	740111	Spring	1
2	781725	Jumper	1
3	770290	Ribbon Feed Assembly	1
4	467980	E-Ring	1
5	770869	Correction Stud	1
6	771411	Ribbon Feed Plunger	1
7	428090	Spring	1
8	775292	Correction Lift Bellcrank	1
9	770277	Plunger Spring	1
10	770868	E-Ring	1
11	777242	Self Tap Screw	1
12	782122	Ribbon Drive Solenoid, w/Ref 21, USA, Canada	1
13	770298	Wire Strap	1
14	747258	Self Tap Screw	1
15	790338	Cassette Feed Pawl Latch	1
16	771464	Spring	1
17	770833	Anti-Backup Spring	1
18	770189	Ribbon Feed Shaft Assembly	1
19	749841	Spring	1
20	770292	Ribbon Driver	1
21	751057	Connector, 2 Pin	1

RIBBON CASSETTE &
CORRECTION CASSETTE MECHANISM



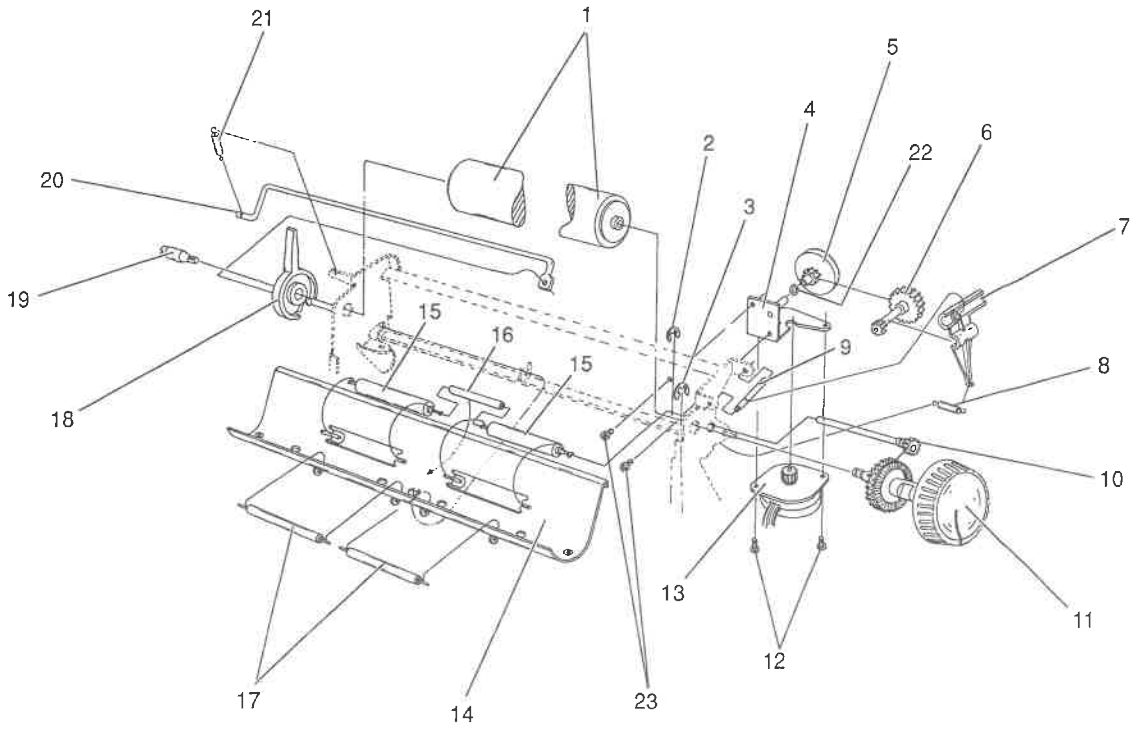
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	777014	Cassette Latch	1	10	771807	Correction Ribbon Feed Pawl	1
2	771818	Ribbon Hub Ratchet	2	11	771826	Correction Ribbon Actuator	1
3	771917	Spring	2	12	428090	Spring	2
4	771912	E-Ring	2	13	776574	Correction Bail Assembly	1
5	777003	Tension Carrier	1	14	770686	Spring	1
6	777004	Tension Pawl	1	15	771843	Spring	1
7	777002	Spring	2				
8	790432	Carrier Restraint Latch	1			**Unique International Label**	
9	796299	Correction Ribbon Feed Arm	1	16	792234	Warning Hot Label, UK, Australia	1

HAMMER



REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	790337	Hammer	1	12	770432	Hammer Plate	1
2	746485	Hammer Spring	1	13	770280	Washer	1
3	776582	Pivot Screw	2	14	770297	Screw	1
4	770296	Pivot Nut	2	15	771469	Screw	1
5	772020	Plunger Cap	1	16	736900	Connector, 2 Pin	1
6	771836	Ribbon Guide	1	17	771463	E-Ring	1
7	790375	Hammer Solenoid Complete, w/Ref 16	1	18	748562	O-Ring	1
8	772920	Screw	1	19	749789	Hammer Solenoid Retainer	1
9	770162	Latch Trip	1	20	747258	Self Tap Screw	2
10	771419	Spring	1	21	749735	Printwheel Pusher	1
11	774765	Hammer Latch Lever	1	22	770924	Pusher Spring	1

PAPER FEED



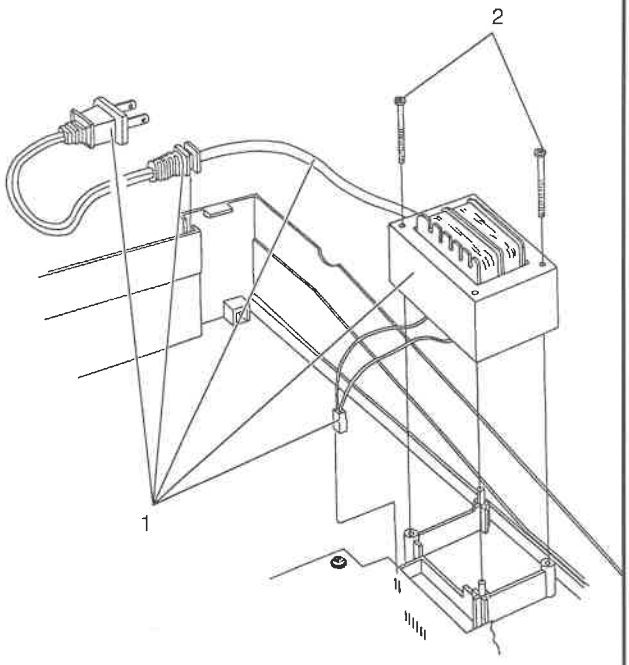
REF	PART NUMBER	PART NAME	QTY
1	796253	Platen Assembly	1
2	105100	E-Ring	1
3	771930	E-Ring	1
4	771449	Linespace Bracket	1
5	770165	Pinion Face Gear	1
6	750056	Linespace Pinion	1
7	771462	Linespace Pinion Pivot	1
8	770199	Linespace Pinion Spring	1
9	771460	Pinion Carrier	1
10	790938	Gear Drive Shaft	1
11	776350	Platen Knob, Black, 5ACM, 5AKL	1
11	776355	Platen Knob, Silver Ash, Models 5AWN, 5ADL	1
12	771461	Self Tap Screw	2
13	790427	Linespace Motor Assembly	1
14	796290	Paper Table	1
15	776370	Paper Feed Roller, Rear	2
16	790805	Link	1
17	771611	Paper Feed Roller, Front	2
18	750077	Paper Release Lever, Black, Small Jacket Models	1
19	750075	Left Platen Shaft, Small Jacket Models	1
20	753580	Paper Release Shaft	1
21	751437	Paper Release Spring	1
22	752735	Washer	*
23	771466	Self Tap Screw	2

***Note:** Use only as required.

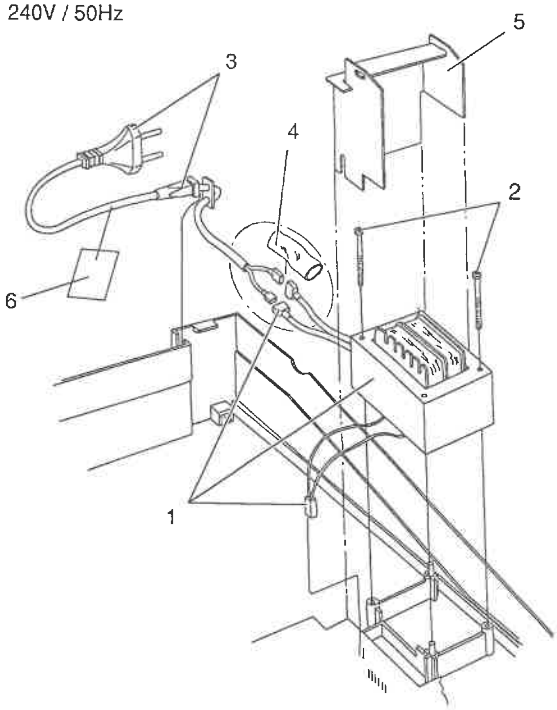
Unique International Parts

11	776350	Platen Knob, Black, 5ACR, 5ALF, Australia, UK, French/Canada	1
11	776355	Platen Knob, Silver Ash, 5ALE, 5AES	1

TRANSFORMER
117V / 60Hz



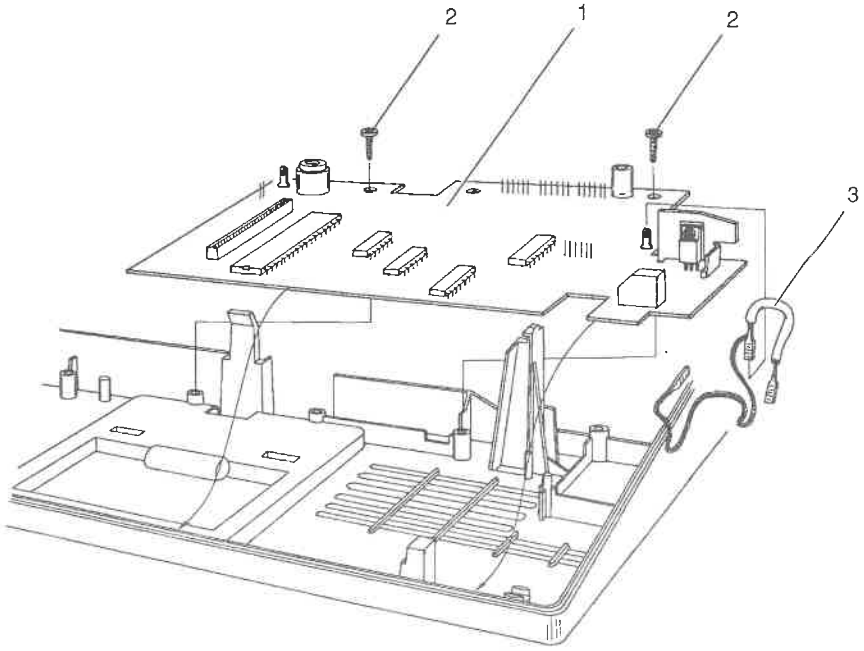
TRANSFORMERS
230V / 50Hz
240V / 50Hz



REF	PART NUMBER	PART NAME	QTY
1	910921	Transformer Assembly, with Attached Line Cord, 120V/60Hz, All Small Jacket Models	1
2	777241	Screw, Transformer Mounting for Small Jacket Models, USA, Canada	2
		Unique International Parts	
1	910887*	Transformer Assembly, with Attached Line Cord without AC Plug, 240V/50Hz, Small Jacket Models, UK	1
1	910891*	Transformer Assembly, with Attached Line Cord with AC Plug, 240V/50Hz, Small Jacket Models, Aust.	1
1	910965*	Transformer Assembly, with Attached Line Cord with AC Plug, 230V/50Hz, Small Jacket Models, Germany, Holland, Spain, France, Sweden, Denmark	1
2	770434	Screw, Transformer Mounting, UK, Australia, Germany, Holland, Spain, France, Sweden, Denmark	2
3	783515	Line Cord, Detachable, Small Jacket Germany, Holland, Spain, France, Sweden, Denmark	1
4	753610	Flex Tubing, Small Jacket, Germany, Holland, Spain, France Sweden, Denmark	1
5	774050	Transformer Shield, Germany, Holland, Spain, France, Sweden, Denmark	1
6	771913	Power Cord Tag, UK	1

***International Transformers are available for sale only to International Distributors.**

CONTROL PC BOARDS
SMALL JACKET MODELS
5ACM, 5AWN, 5AKL, 5ADL,
5ALE, 5ACR, 5AES, 5ALF



REF	PART NUMBER	PART NAME	QTY
1	775850	Control PC Board, 5ACM, 5AWN, 5AKL, 5ADL, 5ACR, USA, French/Canada (See Note 1 below)	1
2	747258	Screw	2
3	782418	Ground Cable Assembly, Right	1

Note 1: Control PC Board 775850 is Jumper Selected for USA. Remove Jumper W3 and install Jumper W4 for French/Canada applications.

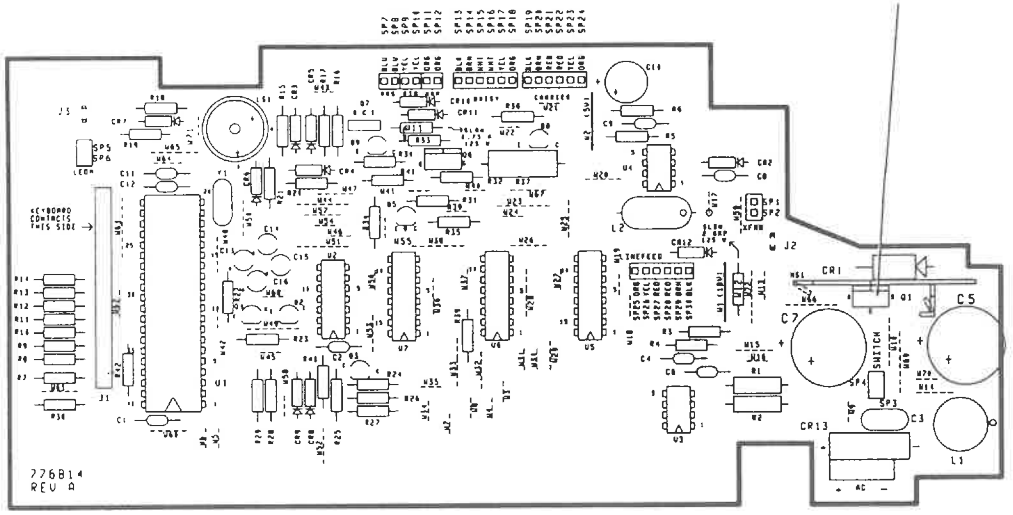
REF	PART NUMBER	PART NAME	QTY
		International Control PC Board	
1	775860	Control PC Board, 5ACR, 5ALE, 5AES, 5ALF, Germany, Holland, UK, Australia, Spain, France, Sweden, Denmark. (See Note 2 below)	1

Note 2: Con trol PC Board 775860 is supplied with Jumper W3. Also, this PC Board contains a zero profile IC Socket for position U1; therefore, the appropriate U1 must be ordered with this Control PC Board (refer to Page 15). See the Jumper Configuration for each country listed in Service Manual, Form 3-0770, complete with all updated pages inserted from Publication Bulletins.

COMPONENT LISTING
CONTROL P.C. BOARD
MODELS: 5ACM, 5AWN, 5AKL,
5ADL, 5ALE, 5ACR, 5AES, 5ALF

P/N 775850
775860

SC1, VI1, AND WS1 ARE USED FOR MOUNTING HEAT SINK TO TRANSISTOR Q1.

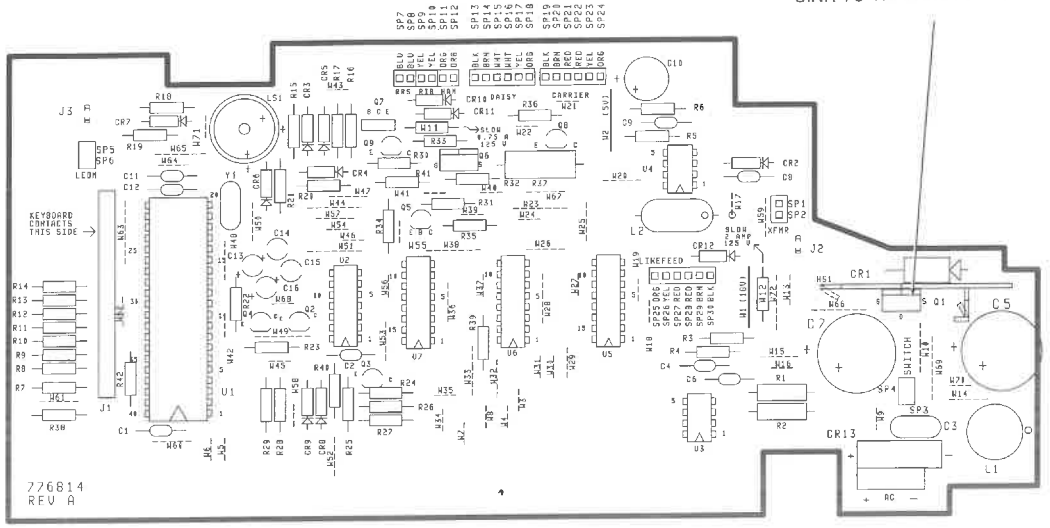


COMPONENT	PART NUMBER	DESCRIPTION
C1, C2, C4, C8	700341	Capacitor, .01µF/50V, Axial, Ceramic, ± 20%
C3	782905	Capacitor, .1µF/100V, Poly Film, ± 10%
C5	730024	Capacitor, 2200µF/50V, Radial, Electric
C6	741575	Capacitor, 390pF/100V, Axial, Ceramic, ± 5%
C7	730042	Capacitor, 3300µF/25V, Radial, Electric, ± 20%
C9	741576	Capacitor, 270pF/100V, Axial, Ceramic, ± 5%
C10	730033	Capacitor, 1000µF/6.3V, Radial, Electric
C11, C12	700365	Capacitor, 30pF/100V, Axial, Ceramic, ± 5%
C13	736112	Capacitor, 1µF/50V, Radial, Electric
C14-C16	730012	Capacitor, 10µF/16V, Radial, Electric
CR1	760479	Diode, Schottky, MBR350, 50V, 3 Amp
CR2	760421	Diode, 1 Amp, Schottky, 1N5819, 1 Amp
CR3, CR6-CR9	709100	Diode, Silicon, Switching, 1N914, 100V
CR10, CR11	722058	Diode, Rectifier, 1 Amp, Fast Recovery, 1N4933
CR12	700521	Diode, Rectifier, 1 Amp, 50V, 1N4001
CR13	770802	Bridge Rectifier, 4 Amp, 100V
J1	770150	Connector, Flex Cable, .100 Centers, 17 Position
J2, J3	752076	Terminal, Disconnect, .110 Tab
L1	783573	Inductor, Vertical, 2 Pin, 80µH, 6 Amp
L2	781901	Inductor, Axial, 100µH, Axial
LS1 (Beeper)	728783	Audio Transducer, 12V
Q1	591041	Transistor, P-Channel, 50V, IRF9Z20
Q2, Q3, Q5, Q9	702518	Transistor, NPN, Switching, 2N3904
Q4	703714	Transistor, PNP, Switching, 2N3906
Q6	783574	MOSFET, N-Channel, 60V, MTP3055
Q7	743086	Transistor, NPN, Darlington, 2N6039
Q8	774507	Transistor, PNP, 1.5 Amp, MPS750
R1	760450	Resistor, 470 Ω, 1 W, 5%
R2	760455	Resistor, 680 Ω, 1 W, 5%
R3	748289	Resistor, 137 K Ω, 1/4 W, 1%
R4, R5	748290	Resistor, 10.2 K Ω, 1/4 W, 1%

COMPONENT LISTING
CONTROL P.C. BOARD
MODELS: 5ACM, 5AWN, 5AKL,
5ADL, 5ALE, 5ACR, 5AES, 5ALF

P/N 775850
775860

SC1, VI1, AND WS1 ARE USED FOR MOUNTING HEAT SINK TO TRANSISTOR Q1.



COMPONENT	PART NUMBER	DESCRIPTION
R6	748291	Resistor, 3.4 K Ω, 1/4 W, 1%
R7-R13, R21, R28, R30, R38	701287	Resistor, 39 K Ω, 1/4 W, 5%
R14, R15, R34, R39, R42	701252	Resistor, 220 Ω, 1/4 W, 5%
R18, R19	701253	Resistor, 270 Ω, 1/4 W, 5%
R22, R29, R41	701268	Resistor, 10 K Ω, 1/4 W, 5%
R23, R25-R27, R40	701254	Resistor, 1 K Ω, 1/4 W, 5%
R24	748227	Resistor, 220 K Ω, 1/4 W, 5%
R31	701256	Resistor, 18 K Ω, 1/4 W, 5%
R32, R36	701280	Resistor, 1.8 K Ω, 1/4 W, 5%
R33	781720	Resistor, 11 Ω, 1/4 W, 5%, Wire Wound
R35	701276	Resistor, 1.5 K Ω, 1/4 W, 5%
R37	781501	Resistor, 220 Ω, 2 W, 5%
SC1	781910	Transistor Mounting Screw for Q1
SP1-SP30	748858	Stake Pin, .025 Square
U1	786976	IC, Microprocessor, 8052, USA & French Canada
U2	724700	IC, Hex Inverter, Open Collector, 7406
U3, U4	782900	IC, Power Supply Controller, MC34063A
U5-U7	781722	IC, Quad Driver, Inverting, L-6220
VI1	725119	Vinyl Insulator for Q1
W1-W4, W9, W10, W13-W72	705294	Jumper Wire
WS1	781628	Screw Mounting Bushing for Q1
Y1	736950	Resonator, Ceramic, 12 MHz
U1	786523	IC, Microprocessor, 8052, Germany
U1	786526	IC, Microprocessor, 8052, Sweden
U1	786630	IC, Microprocessor, 8052, France
U1	786631	IC, Microprocessor, 8052, Denmark
U1	786632	IC, Microprocessor, 8052, Holland
U1	786633	IC, Microprocessor, 8052, Spain
U1	786978	IC, Microprocessor, 8052, UK, Australia
W11	793051	Pico Fuse, .75A, Slo-Blo
W12	793050	Pico Fuse, 2A, Slo-Blo

Numerical Part Number/Page Number Listing

105090 7
105100 11
133250 5
428090 8
428090 9
467980 8
467980 7
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910965 12

SMITH CORONA

July 1992

NOTICE OF CONTENTS

This mailing contains the following items:

SERIES	QTY	DESCRIPTION	NUMBER
5A Series Version 2	1	Service Manual Update	3-0770D
	1	Service Manual	3-0833
	1	Bulletin Index	
	1	Intro Bulletin	#13
5A Series Quiet Print System	1	3-Ring Binder (Red)	
	1	Parts Manual	3-0835
	1	Service Manual	3-0834
	1	Intro Bulletin	#1
		Schematics*	
5F Series Quiet Print System	1	3-Ring Binder (Dk Green)	
	1	Parts Manual	3-0837
Miscellaneous	1	Flat Rate Schedule	

*Schematics for the 5A Series QPS will be sent at a later date.

Refer to General Information Bulletins #14L and 20B for a list of Service and Parts Manuals.

COLOR CODE LIST FOR BINDERS AND PUBLICATIONS

MODEL SERIES	3-RING BINDER COLOR	MANUAL AND/OR BULLETIN COVER COLOR
5A TYPEWRITER	LT BLUE W/DARK BLUE	BLUE
5A VERSION 2 T/W	DARK BLUE W/BLACK	BLUE
5A QUIET PRINT SYSTEM	RED	PINK
5C PWP	MAROON	PINK
5D PWP	WHITE W/BLUE	WHITE W/BLUE
5E PWP	WHITE W/GREEN	WHITE W/GREEN
5F TYPEWRITER	SILVER	GRAY
5F QUIET PRINT SYSTEM	DARK GREEN	GREEN
5G & 5K PWP	WHITE W/RED	WHITE W/RED
5H PWP	WHITE W/VIOLET	WHITE W/VIOLET
5M, 5J, HRMI	5M SERIES WHITE W/GRAY	WHITE W/GRAY
5N SERIES	WHITE W/DARK PINK	WHITE W/DARK PINK

Printed in U. S. A.

SMITH CORONA

September 1991

NOTICE OF CONTENTS

This mailing contains the following six items:

5N Series:	1 3 Ring Binder 1 Service Manual, 3-0812 1 Parts Manual, 3-0813 1 Bulletin #1
5G Series:	1 Bulletin #7, Deck for 5GAA
Notice	"IMPORTANT TELEPHONE NUMBERS"

Refer to General Information Bulletins #14L and 20A for a list of Service and Parts Manuals.

COLOR CODE LIST FOR BINDERS AND PUBLICATIONS

MODEL SERIES	3-RING BINDER COLOR	MANUAL AND/OR BULLETIN COVER COLOR
5A TYPEWRITER	LT BLUE W/DARK BLUE	BLUE
5A VERSION 2 T/W	DARK BLUE W/BLACK	BLUE
5C PWP	MAROON	PINK
5D PWP	WHITE W/BLUE	WHITE W/BLUE
5E PWP	WHITE W/GREEN	WHITE W/GREEN
5F TYPEWRITER	SILVER	GRAY
5G PWP	WHITE W/RED	WHITE W/RED
5H PWP	WHITE W/VIOLET	WHITE W/VIOLET
5M & 5J, HRMI	5M SERIES WHITE W/GRAY	WHITE W/GRAY
5N SERIES	WHITE W/DARK PINK	WHITE W/DARK PINK

Printed in U. S. A.

SMITH CORONA

SERVICE BULLETIN

TO: Technical Service & Training
Regional Service Managers
Service Locations
Canada & International
Electronic Servicing Dealers

NO: 7

PRODUCT:
5G Series
Personal Word Processors

SUBJECT: **Unique Printer Deck for 5GAA Daisy Wheel Printer (DWP I)**

DATE: September 16, 1991

The unique Deck for DWP I Daisy Wheel Printer with High Mass Hammer and Rear Roller Drive is listed below. For all other parts, refer to 5G Series Parts Manual, Form 3-0779 and Service Bulletin #6.

For service information, refer to 5G Series Service Manual, Form 3-0778 and Bulletins.

Part Number	Description
900980	Deck, DWP I with Graphics

Smith Corona reserves the right to discontinue parts at any time and/or to furnish substitutes.

Printed in U. S. A.

SMITH CORONA

SERVICE BULLETIN

TO: Technical Service & Training
Regional Service Managers
Service Locations
Canada & International
Electronic Servicing Dealers

NO: 1

PRODUCT:
5N Series Personal
Word Processors

SUBJECT: **Servicing 5N Series Personal Word Processors**

DATE: September 16, 1991

This Bulletin provides information on the service support programs for new 5N Series Personal Word Processors. These model prefix and model names are as follows:

7 Line LCD Models:

Model Prefix	Model Name	Model Prefix	Model Name
5NEC	PWP 1200	5NEB	PWP 2200
5NCC	PWP 125	5NCB	PWP 225
5NDC	PWP 57D	5NDB	PWP 67D
5NWC	Mark 1000		

14 Line LCD Models:

Model Prefix	Model Name
5NEA	PWP 3200
5NCA	PWP 325
5NDA	PWP 77D

All the models listed above incorporate a 3.5" DOS Compatible Disk Drive and new Electronics based on the MC68000 Microprocessor.

Service Features:

5N Series Personal Word Processors have a Service Diagnostics Menu which, at this time, includes self-typing, energizing the Element Motor for making adjustments, and software version identification. These features are discussed in detail on page 6-14 of the Troubleshooting section of the Service Manual, Form 3-0812.

The Carrier is similar to the 5C Series design. In all, there are eight adjustments which can be made with common service tools. No special test equipment, tools, or gages are required to service the machine, and most adjustments can be accessed with only the Mask removed.

Service Publications: Insert the following manuals in the 5N Series White with Dark Pink 3-Ring Binder:

Form Number	Description
3-0812	Service Manual for 5N Series Personal Word Processors
3-0813	Parts Manual for 5N Models listed above

- Over -

Printed in U. S. A.

Service Publications (continued):

Updates to publications will be made by a **Publications Bulletin** that has the same base form number as the publication being updated. For example, the first update to the Service Manual, Form 3-0812, will be Publications Bulletin 3-0812A, the next update will be 3-0812B, and so on. Updates should be incorporated into the Manual. Reprints of a Manual (i.e. 3-0812-1, 3-0812-2, etc.) will include all previously issued Publication Bulletins as indicated on the Contents page of the reprint.

Service Bulletins:

Service Bulletins for the 5N Series Personal Word Processors will be printed on white paper with dark pink headings. Bulletins are released when product changes occur and when additional information is required. Bulletins are consecutively numbered; however, number gaps in your Bulletins are likely to occur because Bulletins are issued only to those they apply to. For example, Dealers would not receive an exclusive Bulletin on a private label model.

5N Series Owner's Manuals: See Parts Manual, Form 3-0813.

Service Tools & Lubricants: See the Contents Page of Service Manual, Form 3-0812.

Ordering Parts:

USA Dealers should refer to the current Service Parts Policies and Procedures form for parts ordering and parts return information.

Service Training:

Smith Corona offers one day service training programs in the field. Contact your Regional Service Manager or sales representative for details. Trainees should bring the Service Manual, tools, and a machine to the training class.

Prices:

Prices of parts, tools, etc., are indicated in the current Smith Corona Electronic Parts Price List. Also included are exchange prices for out of warranty replacement of PC Boards. Service Bulletins are no charge when requested. All may be ordered through National Service Stores.

Smith Corona reserves the right to discontinue parts at any time and/or to furnish substitutes.

SMITH CORONA

IMPORTANT TELEPHONE NUMBERS

National Service Stores:

Toll Free Fax: 800-523-2881
24 hours a day / 7 days a week

Faxed orders receive priority!
Use our toll free number
for emergency and stock orders.

Telephone: 607-753-6011 (ext. 160)
8:00 a.m. - 4:30 p.m. Ask for Parts Department
Monday through Friday

Use for telephone orders *only*
when order assistance is required.
Limit 5 parts per order.

USE TOLL FREE FAX FOR
EMERGENCY AND RUSH ORDERS!

Note: Operator's Manuals should be ordered from National Service Stores.

Technical Service:

Tel: 607-753-6011
Ask for Technical Service

Fax: 607-753-7286

Use to obtain technical assistance on service matters.
Do not call the 800 number listed in operator's manuals.
For parts orders, call National Service Stores.

SMITH CORONA

5N SERIES
Personal Word Processors

COMMITMENT TO EXCELLENCE
SMITH CORONA
MADE IN U.S.A.

SERVICE MANUAL

Printed in U.S.A. Form 3-0812
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PREFACE

This Manual provides service information for the following Smith Corona 5N Series Personal Word Processors:

7 Line LCD Models:

Model Prefix	Model Name	Model Prefix	Model Name
5NEC	PWP 1200	5NEB	PWP 2200
5NCC	PWP 125	5NCB	PWP 225
5NDC	PWP 57D	5NDB	PWP 67D
5NWC	Mark 1000		

14 Line LCD Models:

Model Prefix	Model Name
5NEA	PWP 3200
5NCA	PWP 325
5NDA	PWP 77D

The Manual is divided into sections that cover the different service areas required to service the machine. Thus, there is an Adjustment Section, Removals Section, etc. Refer to the Contents Page for a listing of subjects covered.

Except for the Specifications Sections, there is an Index of all information provided in each Section at the beginning of the Section.

Throughout the Manual, directional terms such as front, rear, top, bottom, left, right, etc., always refer to the machine as used by a typist. Consequently, "right" always refers to the Platen Knob side of the machine, regardless of the machine position necessary for checking a requirement or making an adjustment.

Satisfactory performance requires that all parts be properly adjusted and lubricated, and their movements be free of binds. Worn or broken parts should be replaced.

IMPORTANT

Some service procedures require working with static sensitive devices, such as the Printed Circuit Boards. Whenever a procedure involves one of these devices, the procedure is marked:

OBSERVE STATIC PRECAUTIONS

Read the reverse side of the Contents Page (Page ii) carefully for a full understanding of procedures to follow when working with static sensitive devices.

5N SERIES
PERSONAL WORD PROCESSORS
SERVICE MANUAL

CONTENTS

Section	Subject
1	Specifications
2	Theory of Operation
3	Lubrication & Cleaning
4	Removals
5	Adjustments
6	Troubleshooting
7	Diagrams

SERVICE TOOLS

In addition to common service tools (screwdriver, pliers, volt/ohmmeters, etc.) normally required for typewriter service, the following tools are needed for servicing 5N Series Personal Word Processors:

Part Number	Description
250030	1/4" and 3/16" Open End Wrench
250036	1/4" Nut Driver
250072	MTA Wire Inserter (.100" Centers)
250073	Feeler Gage Set .0015"-.025"
250162	Torx T-10 Screwdriver
250165	Torx T-8 Screwdriver

STATIC ELECTRICITY

Static electricity in the service work area damages PC Boards. Smith Corona Electronic Products are equipped with state of the art MOS IC's that are susceptible to damage by static electricity.

Damage can occur when handling or touching a PC Board or even when touching a connecting pin or wire that leads to the Board.

Static electricity is sometimes tough to identify. It takes about 10,000 volts of static electricity to feel a "zap" or see a spark. As little as 1000 volts can damage an IC. A person wearing synthetic soled shoes walking across a carpet in low humidity conditions can generate a charge of over 35,000 volts, enough to destroy all the MOS IC's on a PC Board.

Furthermore, static induced failures do not always occur immediately following exposure, but may result in latent defects that show up in time.

Recommended Static Precautions

- *Do not* have carpeting in the service area or on the workbench. Use an anti-static floor sealant on floor surfaces, particularly on vinyl surfaces.
- *Connect metal workbenches to ground* with a one Meg Ohm resistor cord. Use conductive anti-static work mats, or particle board or wood as a work surface.
- *Wear a wrist strap* that is connected to ground through a one Meg Ohm resistor whenever working on a machine with the top cover off, and, of course, when handling a PC Board, in or out of the pink shipping bag.
- *Do not* allow synthetic fiber clothing (polyester, nylon, etc.) to contact machine components or the PC Board.
- *Do not* slide a PC Board over any surface.
- Keep the following static generators away from the work area: *Styrofoam (including coffee cups) -- Candy wrappers -- Cellophane*

Note: The pink bag in which Boards from Service Stores' are shipped ***does not*** induce a static charge, but it also ***does not*** prevent a static charge from going through to the PC Board. Take static precautions when handling a bagged Board.

The following anti-static equipment is available from National Service Stores:

Part Number	Description
250166	Velcro Adjustable Wrist Strap. Has snap connection for Coiled Cord.
250167	10 Foot One Meg Ohm Coiled Cord. Has banana plug for connection.
250168	Alligator Clip. Used for connecting Coiled Cord directly to an available ground.
250096	Circuit Tester with Ground Jack. Used for connecting Coiled Cord to a power outlet's ground. Particularly useful when no other ground point is available. Circuit Tester also checks for correct wiring and polarity.
250501	Anti-Static Floor Sealant (1 gallon).

SECTION 1

SPECIFICATIONS

Power Supply

Power Requirements: *See Electrical Rating Label on Bottom of Casing Base.*

120 VAC/60 Hz ± 10%
or
230 VAC/50 Hz ± 10%
or
240 VAC/50 Hz ± 10%

Fuse Protection:
- 3 Amp, Slo-Blo Pico Fuse on Transformer Secondary Circuit on Control PC Board.
- .75 Amp Slo-Blo Pico Fuse in Ribbon Solenoid Circuit on Control PC Board for 230 VAC/50 Hz and 240 VAC/50 Hz Models.

Transformer Output:
- 24 VAC (No load)

DC Operating Voltages:
- +18 VDC, +5 VDC, & -13 VDC

Power Consumption:
- Approximately 10 Watts (Idle); 45 Watts (Printing)

Printing/Paper Handling

Printing Technique:
- Fully formed character Daisy Print Element

Character Set:
- 96 printable characters on Print Element

Character Spacing (Pitch):
- 10 CPI: .100" (2.5mm) per space
- 12 CPI: .083" (2.2mm) per space
- 15 CPI: .067" (1.7mm) per space

Typing Line Length: 10" (254mm)
- 10 Pitch: 100 Characters per line
- 12 Pitch: 120 Characters per line
- 15 Pitch: 150 Characters per line

Print Speed:
- 15 Characters per Second (maximum)

Print Direction:
- Uni-directional (left to right)

Preset Margins:
- Left Margin preset at 1"
- Right Margin preset at 7.5"

Tabs:
- 17 (preset every .5"): Up to 20 programmable tab settings

Printing/Paper Handling (continued)

Ribbon Cassettes:	Correctable Film	High Density Correctable Film	Multi-Strike
Width:	.31" (7.9mm)	.31" (7.9mm)	.31" (7.9mm)
Yield:	53,000 Characters	42,000 Characters	205,000 Characters

Correction Tapes:	Lift Off (for Correctable and High Density)	Cover up (for Multi-Strike)
Width:	.31" (7.9mm)	.31" (7.9mm)
Yield:	1400 Characters	1400 Characters

Stepper Motors: (4 Phase, Bi-directional, Permanent Magnet Stepper Motors)

	Carrier	Element	Index
Step Angle:	7.5°	7.5°	7.5°
Steps Per Revolution:	48	48	48
Resistance Per Phase:	50 Ω ± 7%	64 Ω ± 7%	50 Ω or 55 Ω ± 7%
Run Voltage:	+18 VDC	+18 VDC	+18 VDC
Hold Voltage:	+5 VDC	None	None

Paper Feed:
- Friction, Single Sheets or Forms

Linespacing:
- 1 (6 Lines per Inch)
- $1^1/_2$ (4 Lines per Inch)
- 2 (3 Lines per Inch)
- $^1/_2$ through Code Key for Super and Subscript
- Variable through Platen Knob

Maximum Paper Width:
- 12.75" (323.9mm)

Paper Capacity:
- 1 original plus 2 copies

Keyboards

Keyboard:
- 44 Printable Character Keys
- 12 Function Keys plus 5 Cursor Keypad Function Keys
- 56 Molded Dome Conductive Switches with Leaf Return Springs plus 5 Molded Dome Conductive Switches for Cursor Keypad
- 8 x 8 Electronic Keyboard Matrix

Electronics

Control PC Board:

Master Microprocessor: MC68000 -- Master Controler for all machine functions

Slave Microprocessor: Programmed 8052

- Scans Keyboard, Keypad, Left End, & Mode Switches
- Controls Stepper Motors, Solenoids, Shift LED, & Beeper

LCD/System ASIC: (Applications Specific Integrated Circuit)

- LCD Controller
- RAM Controller
- Model Selector
- Disk Controller
- ROM Controller
- Clock Generator

Dictionary ROM: 2 Megabits

Other ROM: (Two 2 Megabit ROMs)

- Initialization routines
- Operating software
- All disk, typing, and printing routines

RAM: (Four 64 K x Four bit DRAM's)

- 27 Character Keyboard Buffer (one character in, one character out, 13.5 character effective Keyboard Buffer).
- Three Line Correction Buffer (in Typewriter Mode Only)
- 128K Word Processor Memory (PWP 2200, PWP 225, PWP 67D, PWP 3200, PWP 325, PWP 77D).
- 64K Word Processor Memory (PWP 1200, PWP 125, PWP 57D, Mark 1000)

Power Supply:

- Produces Three DC Outputs: +5 VDC, +18 VDC, & -13 VDC

System Physical Dimensions

Models PWP 1200, PWP 125, PWP 57D, Mark 1000, PWP 2200, PWP 225, PWP 67D:

- Height: 5.34" (135.6mm)
- Weight: 15.8lbs (7.2Kg)

Models PWP 3200, PWP 325, PWP 77D:

- Height: 5.52" (140.2mm)
- Weight: 16.04lbs (7.3Kg)

All Models:

- Width: 16.9" (429.3mm)
- Depth: 16.5" (319.1mm)

System Environmental Conditions

Operating Temperatures: • 55° F to 100° F (13° C to 38° C)
Operating Relative Humidity: • 30% to 80%
Storage Temperature: • 14° F to 122° F (-10° C to 50° C)
Storage Relative Humidity: • 20% to 90%

Liquid Crystal Display (LCD)

Color: Reflective Type Super Twist LCD w/Black or Blue/Violet Dots

	PWP 3200, PWP 325, PWP 77D	PWP 2200, PWP 225, PWP 67D	PWP 1200, PWP 125 PWP 57D, Mark 1000
Actual Display Area:			
Width:	80 Columns 480 Dots 9.070" (230.4mm)	80 Columns 480 Dots 9.258" (234.95mm)	80 Columns 480 Dots 8.502" (215.9mm)
Height:	14 Lines 128 Dots 2.418" (61.4mm)	7 Lines 64 Dots 1.233" (31.3mm)	7 Lines 64 Dots 1.258" (31.9mm)
Dimensions (Approximate):			
Width:	11.732" (298mm)	11.686" (296.8mm)	10.078" (256mm)
Height:	3.720" (94.5mm)	3.00" (76.2mm)	3.149" (80mm)
Depth:	.452" (11.5mm)	.437" (11.1mm)	.433" (11mm)

Power Requirements:
- Logic Power Supply: +5 VDC
- Liquid Crystal Driver Supply: -13 VDC

Disk Drive

Type:
- 3.5" double sided, double density drive capable of storing and retrieving data from a 3.5" flexible double sided, double density media disk.

Disk Rotating Speed:
- 300 RPM ± 2%

Data Transfer Rate:
- 250 kBPS (Kilobits per second)

Magnetic Storage and Retrieval:
- Double sided, digital recording, storage, and retrieval medium, with 720 kilobytes storage when prepared.

Magnetic Storage Medium:
- 3.5" floppy disk, double sided, double density

Power Requirements:
- Logic Voltage: +5 VDC
- Motor Voltage: +5 VDC

Dimensions (Approximate):
- Length: 6.0" (152.4mm)
- Width: 4.0" (101.6mm)
- Height: 1.0" (25.4mm)

SECTION 2

THEORY OF OPERATION

INDEX

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1) Power Supply

When the Personal Word Processor's AC plug is inserted into an AC outlet and the Power Switch is turned on, line voltage is applied to the primary winding of the transformer. Voltage is induced by the secondary winding of the transformer to produce 24 VAC.

The **24 VAC** is applied to the Bridge Rectifier CR18 on the Power Supply PC Board, which provides approximately 36 VDC input to the following:

A) **18 Volt Regulator Circuit:** The major components are Q13, Q9, L1, U15, U14, and C41. Together these components produce a regulated +18 VDC ± 5%.

B) **5 Volt Regulator Circuit:** Components Q12, Q7, L2, U15, U14, and C42 make up the 5 Volt Regulator Circuit, which provides a regulated 5 VDC ± 5%.

C) **-13 Volt Regulator Circuit** which consists of Q17, Q18, Q19, and VR8.

D) **24 Volt Regulator Circuit:** Zener Diode CR6 creates the 24 VDC Supply.

The **+18 VDC** is used for driving the Carrier Motor, Element Motor, Index Motor, the Hammer Solenoid, the Ribbon Solenoid, and some discrete PC Board Components.

The **+5 VDC** is used for Integrated Circuits, Shift Lock LED, Liquid Crystal Display (LCD), Carrier Holding Voltage, Disk Drive Logic, and Disk Drive Motor.

The **-13 VDC** is used for the LCD Contrast Control and the LCD operating Voltage.

The **+24 VDC** is used by Comparator U14 in regulating the +5 VDC and +18 VDC power supplies, and provides a +5 VDC reference through Zener Diode VR7 for use in the Power Supply Circuit.

The **Power Supply** has a Watchdog Control Circuit that checks the voltage and current on the 18 volt line to monitor the Motors and Solenoids.

If any of these components are left on, and the 18 Volt line drops below approximately 16.9 volts long enough to charge C40, CR10 and CR11 become forward biased to turn on Q8, which shorts U14, Pin 8 to ground. This shuts down the clock circuit to U15, which in turn shuts down the 18 volt and 5 volt supplies.

There is also a Hammer Watchdog Circuit. If U13 keeps the Hammer turned on too long, Q16 turns off, C25 charges, CR19 & CR20 become forward biased to turn on Q8, which shorts U14, Pin 8 to ground. This shuts down the clock circuit to U15, which in turn shuts down the 18 volt and 5 volt supplies.

For safety, there is a replaceable 3 Ampere Slo-Blo Pico Fuse mounted on the Control PC Board in the Transformer Secondary Circuit. Also, on 50 Hz machines, there is a .75 Ampere Slo-Blo Pico Fuse to protect the Ribbon Solenoid Circuit.

2) Initialization

The initialization sequence is described in full detail in the troubleshooting section of this manual. Briefly, the sequence is as follows:

A) When power is turned on, the Ribbon Solenoid quickly energizes to insure the Ribbon mechanism is in its proper starting position, and the Disk Drive Power Light turns on and off to indicate the Disk Drive is working properly.

B) The Electronics moves the Carrier slightly to the right, to insure Carrier is not at the Left End Switch and then slightly to the left to insure the Carrier is not at the right end of the machine.

C) The Index Motor Shaft rotates $^1/_2$ forward linespace and then $^1/_2$ reverse linespace to establish a positive writing line.

D) Then, the Element Motor rotates quickly to snap the Element onto the Drive Disc, and then stops.

E) The Carrier moves left until the Left End Switch Positioner closes the Left End Switch; quickly moves right to open the Switch; left to close the Switch again; and continues approximately .100" further before stopping.

F) The Element rotates slowly counterclockwise until the Left End Switch Positioner drops into the Element Home Notch on the Rear Scissors Gear under Spring Tension, which opens the Left End Switch, and the Element stops rotating.

G) The Carrier moves right approximately .250" to establish position "0."

H) The LCD is turned "On." First the Smith Corona Copyright Message is displayed, followed by the Typewriter Status or Word Processor Main Menu.

I) The Index Motor rotates $^1/_2$ forward and $^1/_2$ rearward linespace, and the Carrier then continues to the preset left margin (Space 10). The default settings are 10 pitch, with Left Margin at 10, Tabs set every .5", and Right Margin at 75.

The Left End Switch is also used as a Lid Switch. Whenever the Deck is raised, the Lid Switch Actuator closes the Left End Switch through Spring tension, and the Carrier moves to the approximate center of the Platen. When the Deck is closed, the Switch opens, and the Carrier reinitializes and relocates to its previous position.

3) Keyboard

The Keyboard and Keypad are composed of Keybuttons mounted in a plastic housing along with individual leaf-type springs, molded Dome Conductive Switches, a Flexible Circuit PC Board, and a metal plate. When a Keybutton is depressed, the Keybutton contacts the leaf-type spring, which in turn pushes down on a Molded Dome Conductive Switch. The Conductive Switch then comes into contact with the 8 x 8 matrix Flexible Circuit PC Board which now completes a circuit between a specific Column and Row. The Keybuttons on the Keypad do not use a leaf spring, but make direct contact with a Molded Dome Conductive Switch to contact the Matrix. This completed circuit is then read by the Electronics of the Control PC Board, which determines what key was depressed.

3) **Keyboard (continued)**

A) **Key Scanning:** When a Keybutton is depressed, the Molded Dome Switch closes a circuit between the Column and Row in the Keyboard Matrix. The Keyboard Matrix Rows are normally held in a high state. When a circuit closes between a Row and a Column, the Row is pulled low. The Motor Controller (8052) Microprocessor senses this low state, and sequentially pulses Rows R7 through R0 every 5ms (milliseconds) to determine which key was depressed. The Electronics determines which Keybutton was depressed by comparing which "R" Row was pulsed at the point in time that the "C" Column became active. If the same "R" Row and "C" Column activity is detected through two scanning cycles, the Electronics interprets this as a valid Keybutton depression and activates the circuits to perform the appropriate function. If no Key is depressed, the electronics keeps all rows high to quickly identify a depressed key. After that Keybutton is identified, the electronics returns to sequentially pulsing the Keyboard Rows for a short time before returning to a standby state.

When any Keybutton is held down, the Electronics delays 500ms after performing a function to verify that a repeat is desired, and then activates the circuits to continue performing that function until the Keybutton is released.

The 8052 monitors the Mode Selector Switch and Left End Switch ports every 12.5ms to insure that the status of these ports is correctly interpreted. If either of these ports is pulled low, the 8052 activates the appropriate circuit in response to this input.

B) **Non-Matrix Keyboard Functions:** The Shift Lock LED lights when the Shift Lock Keybutton is depressed. When the LED is on, the electronics performs all printing functions in upper case. When either Shift Keybutton or the Shift Lock Keybutton is subsequently depressed, the Electronics turns the LED off, and printing resumes in lower case.

4) **Electronics**

The Control PC Board includes Logic, Power Driver, and Memory (RAM & ROM) circuitry. The functions of the Control PC Board are described below:

The **Control PC Board** is the heart of the PWP. It monitors input data, makes decisions, and controls output data and signals.

Input components to the Control PC Board include Left End/Lid Switch, Mode Selector Switch, Keyboard, and Disk Drive.

The two main decision making IC's on the Control PC Board are the 8052 Microprocessor and the Memory Controller (MC68000) Microprocessor.

The 8052 responds to commands from the MC68000 and determines which motors and solenoids must be energized to perform a function, and when and for how long they must be energized. The Motor Controller activates the circuits to perform the function, and signals the MC68000 that the function has been performed. The 8052 monitors the Left End Switch during initialization and during machine operation to check if the switch was closed due to the Deck being raised. Also, the Motor Controller interprets the information it receives from scanning of the Keyboard, Keypad, Left End Switch, and Mode Selector Switch. After interpretation, the Motor Controller reacts and communicates with the MC68000.

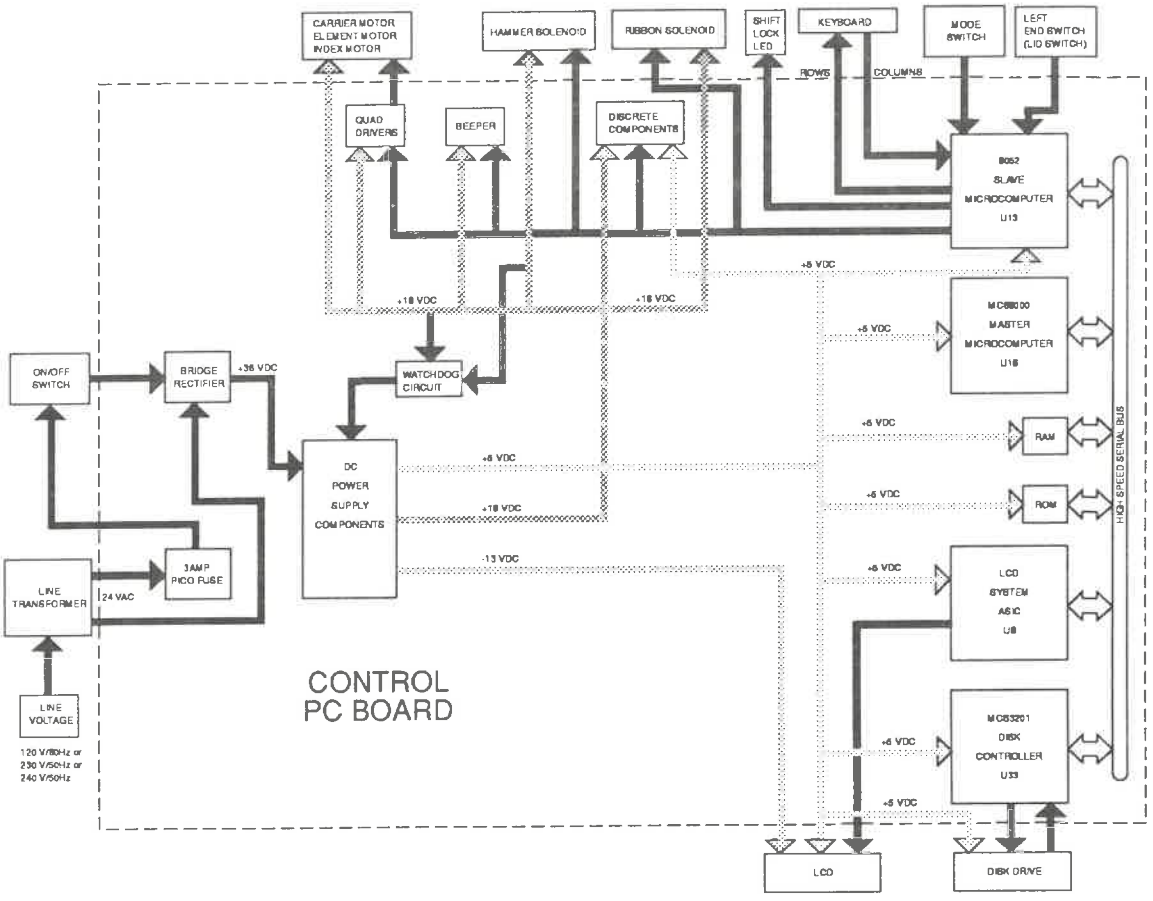
4) **Electronics (continued)**

The **MC68000 Microprocessor** sends and receives information to the LCD System ASIC, Disk Drive Controller, Operating ROM, and Motor Controller (8052) Microprocessor through a High Speed Serial Bus (HSSB). The MC68000 and these other devices constantly communicate with each other in order to maintain proper timing and keep the operating functions in proper sequence so everything runs smoothly.

The LCD System Applications Specific Integrated Circuit (ASIC) is a state of the art (120 pin) integrated circuit. Basically, it is an Address Decoder, USART, and Frequency Divider which performs the following functions:

A) **System Controller** -- sends Reset signal to the MC68000, 8052, and Disk Controller at power up.
B) **Disk Controller** -- controls the data flow to and from the Disk Drive Controller.
C) **RAM Controller** -- insures that the RAM is refreshed and has to choose whether to read the RAM or the ROM.
D) **ROM Controller** -- controls the Chip Enable for the different types of program ROM's used.
E) **Model Selector** -- tells the MC68000 the Model that the Board hardware is set for.
F) **Clock Generator** -- produces different Frequency Clock signals from the Main Crystal (36 MHz) that are used by other IC's.

ELECTRONIC BLOCK DIAGRAM



5) Liquid Crystal Display (LCD)

The LCD is an 80 columns (characters) wide by 14 lines or 7 lines reflective type Super Twist electronic dot display. Each character is 5 dots wide by 7 dots high. The color of the display is Silver Tone with dark blue/violet or black dots. The programming for the lines on the display is such that a blank dot appears between lines for clear readability. The LCD requires +5 VDC and -13 VDC to operate. Electronic data is sent from the Control PC Board to the LCD. Electronic drivers on the LCD turn on the required dots to form each individual character. The contrast of the characters formed in the Display is regulated by the Contrast control which is mounted on the LCD PC Board. This control is a potentiometer that in effect varies the -13 VDC from -13 VDC to 0 VDC.

6) Disk Drive

The Disk Drive is a double sided, double density drive capable of storing and retrieving data from a 3.5" inch double sided. double density storage disk. The Disk Drive requires +5 VDC for both Logic Voltage and Disk Drive Motor Voltage. The Disk Drive prepares (formats) the disk into 160 Tracks. This allows a minimum of 720 Kilobytes of text storage in any number of files on the two sides of the Disk. Note: Some models are programmed to only use one side of the Disk at a time.

The operating voltage (+5VDC) for the Disk Drive is supplied by the Control PC Board through the Disk Drive Power Supply Connector, and is always present when the machine is on. When a Disk Drive function is selected, the Control PC Board sends a Drive Select signal to the Disk Drive which selects one of the two Disk Drive Heads. The selected Head moves to Track 0, and signals the Control PC Board that it is ready for reading or writing data. The Control PC Board sends a low signal on the Write Gate if there is data to be written to the Disk, or holds the Write Gate high if data is to be read into the system RAM. The Disk Drive Electronics responds to the input from the Control PC Board to position the Read/Write Heads and read or write as directed by the Control PC Board.

The Control PC Board provides electronic data and communications to the Disk Drive through the ASIC and Disk Controller chips When information is stored on the disk, the ASIC internally converts Parallel data to Serial data. The Serial information is then processed internally by the Disk Controller which converts this Serial information to a Modified Frequency Modulation (MFM) signal. This MFM signal is then sent to the Electronics of the Disk Drive for processing and text storage to the disk. The opposite sequence occurs when information is read from the disk and sent to the ASIC chip.

7) Stepper Motors

There are three unipolar, four phase, Permanent Magnet Stepper Motors in the machine -- the Index, Carrier, and Element Motors.

A) Construction

Each Stepper Motor is made of a radially magnetized Rotor with alternating North and South Poles, and two Stator Sections, A and B.

The Stator Sections each have Bifilar coils wound around a plastic bobbin in the inside diameter of the Stator. When the two Stator Sections are assembled, the teeth of one section are aligned one half tooth away from similar teeth in the other section.

Opposite ends of the Bifilar coils are connected internally and brought out of the stator through a common lead wire. The other end of each coil can be switched to ground through the Electronics. Only one coil of each Bifilar pair is switched to ground at any given time. There are two Bifilar pairs in the stator. The windings in one pair are referred to as A and A', and the windings in the other pair are called B and B'. The direction of current flow is the same in windings A and B, which is opposite to the direction of current flow in A' and B'. The current flowing through the coil creates lines of magnetic flux which charge the Stator Teeth as either North or South Poles. The Stator is constructed so that adjacent teeth are opposite poles when current is flowing through the coil. When current flows in the opposite direction, the polarity of the Stator Teeth changes to attract and repel the poles on the Rotor. Sequentially changing the direction of current flow rotates the Rotor through magnetic attraction and repulsion.

B) Drive Strategy

The three Stepper Motors make use of different Run, Settle, and Hold voltage levels during operation which are regulated by the Electronics. A run level voltage is applied to the active halves of the coils to produce a strong magnetic field during operation. A settle level voltage is used as a transition voltage when one half of a coil is switched off and the other half switched on. The Carrier Motor also makes use of a third voltage level (Holding Voltage), when stationary, to keep the Carrier stable for printing. The Holding Voltage is drawn off the +5 VDC, and stays between +4 to +4.5 VDC.

Operating Voltages

Motor	Run Voltage	Settle Voltage	Holding Voltage
Carrier	+18 VDC	+18 VDC	+4.3 VDC (Approximate)
Element	+18 VDC	+18 VDC	None
Index	+18 VDC	+18 VDC	None

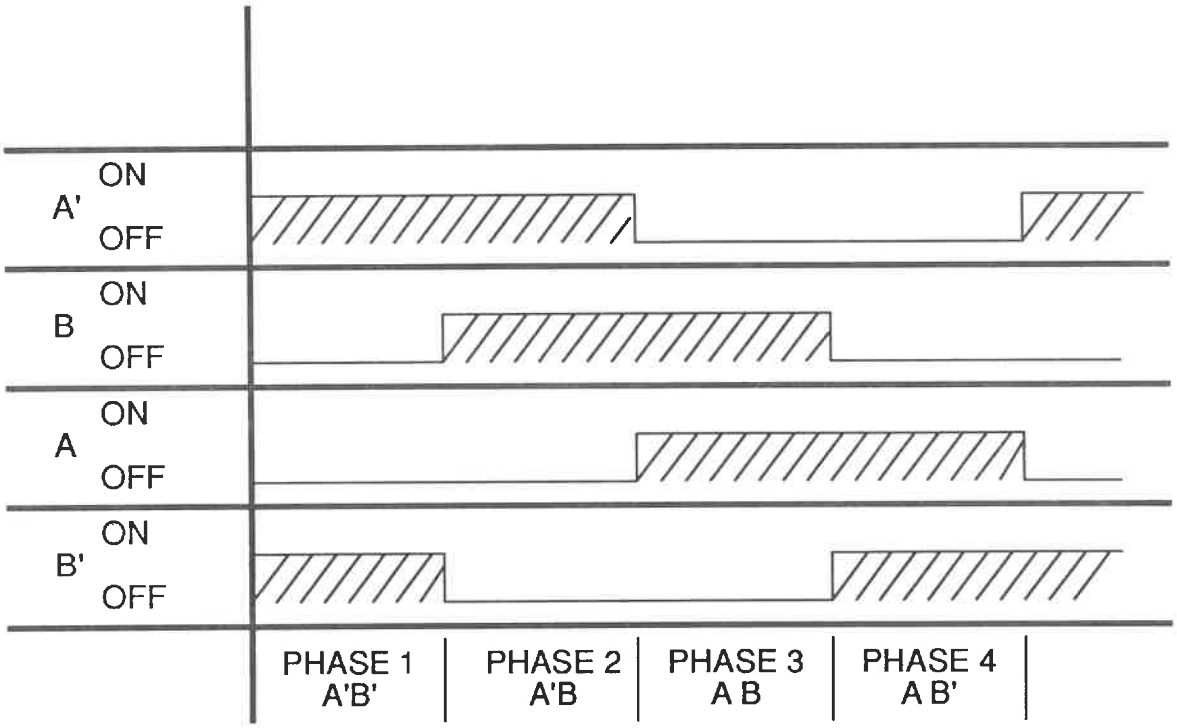
As the Motor Phases change the lines of magnetic flux, the Permanent Magnet Rotor rotates through magnetic attraction and repulsion. The Electronics reverses the phase sequence for reverse Rotor rotation. Note: The terms "Phase 1," "Phase 2," etc., are used for description purposes only. The actual starting phase for any motor move is dependent upon where the motor stopped in its previous move, and on the programming in the Electronics. All subsequent motor steps follow the normal sequence. The starting phase for the Carrier Motor is dependent upon the pitch selected and the actuation point of the Left End Switch.

7) Stepper Motors (continued)

C) Step Angles

The Stator Teeth and magnetic Rotor Poles of each motor are arranged so that each successive Phase that is energized rotates the Rotor the same number of degrees. The step angle for all Motors is 7.5°, which means there are 48 full steps per revolution. The number of phases that are energized to perform any particular function is dependent on the nature of the function.

STEPPER MOTOR TIMING CHART



8) Carrier Drive

The Carrier Motor is mounted on the rear of the Carrier Molding. Driven by the Electronics, the Carrier Motor rotates clockwise and counterclockwise to move the Carrier left and right along the Carrier Rails for printing, correction, and spacing functions.

There is a 12 tooth Drive Gear permanently attached to the Carrier Motor Rotor Shaft. This Gear meshed with a one piece Carrier Drive Rack which mounts above the Carrier Drive Gear. The Carrier Drive Gear is under tension by a Spring and Anti-Backlash slider that pushes down on the Carrier Drive Rack. This spring tension reduces Gear backlash and maintains a constant mesh between the Carrier Drive Rack and Gear.

9) Element Drive

The Element Motor is mounted on the rear of the Carrier Molding. Driven by the Electronics, the Element Motor rotates clockwise and counterclockwise to place the desired character on the Print Element in line with the Hammer for printing and correction.

There is a 48 tooth Drive Gear permanently attached to the Element Rotor Shaft. This Drive Gear is in mesh with a 96 tooth, two piece Element Scissors Gear. The front half of the Element Scissors Gear is pressed onto the Element Drive Shaft, so that when the Element Motor rotates clockwise and counterclockwise the Element Drive Disc rotates also.

The Left End Switch Positioner is mounted on the rear cross frame of the Frame Assembly. During initialization, the Left End Switch Positioner tooth contacts the ridge on the Rear Scissors Gear. When the Element Motor rotates counterclockwise, the Positioner Tooth drops into the Notch in the Gear Ridge to stop the Element at Home Position.

The Element Drive Disc has two rectangular holes and one round hole which are keyed to fit the Print Element. When a Print Element is inserted, and the Hammer Assembly is pivoted rearward against the Element, the Element Pusher (mounted in the Hammer Solenoid Bracket) pushes the Element against the Drive Disc. During initialization, the Element rotates quickly clockwise to snap the Element onto the keyed holes in the Element Drive Disc under tension of the Element Pusher. The keyed holes assure that the Home Character (e) is at Print Position when the Positioner Tooth is engaged in the Notch on the Rear Scissors Gear.

Element Home Position is established during initialization. If a new Print Element is inserted after initialization, opening and closing the Lid reinitializes the machine to reestablish Home position.

The Electronics is programmed to select the shortest distance to the next printable character on the Element whether printing from the Buffer or starting at Home Position.

10) Print Hammer

The Print Hammer is pivotally attached to the Hammer Assembly Bracket, and rests on the Hammer Solenoid Plunger under spring tension. When the Electronics energizes the Hammer Solenoid for printing, the Solenoid Plunger moves upward to pivot the Hammer top rearward to strike the Print Element Petal in its path against the Platen. When the Hammer Solenoid is de-energized, the Hammer returns to rest under spring tension.

The Electronics is programmed to energize the Hammer Solenoid for longer or shorter periods of time to provide stronger or weaker impression for individual characters. For broad faced characters (W, M, etc.), the Electronics energizes the Solenoid for a longer period of time than for small faced characters (., _, etc.). There are various time periods programmed in the Electronics to provide equal impression among all characters in all pitches.

11) Cassette Ribbon Feed/Correction Ribbon Lift & Feed

The Cassette Ribbon Feed and Correction Ribbon Lift & Feed are both driven by the same mechanism. This mechanism has one solenoid which is energized every Cassette Ribbon or Correction Ribbon cycle. A latching system, controlled by the energizing of the Print Hammer Solenoid, triggers either a Cassette Ribbon Feed or a Correction Lift and Feed. The normal position of this latch mechanism is Correction Lift and Feed.

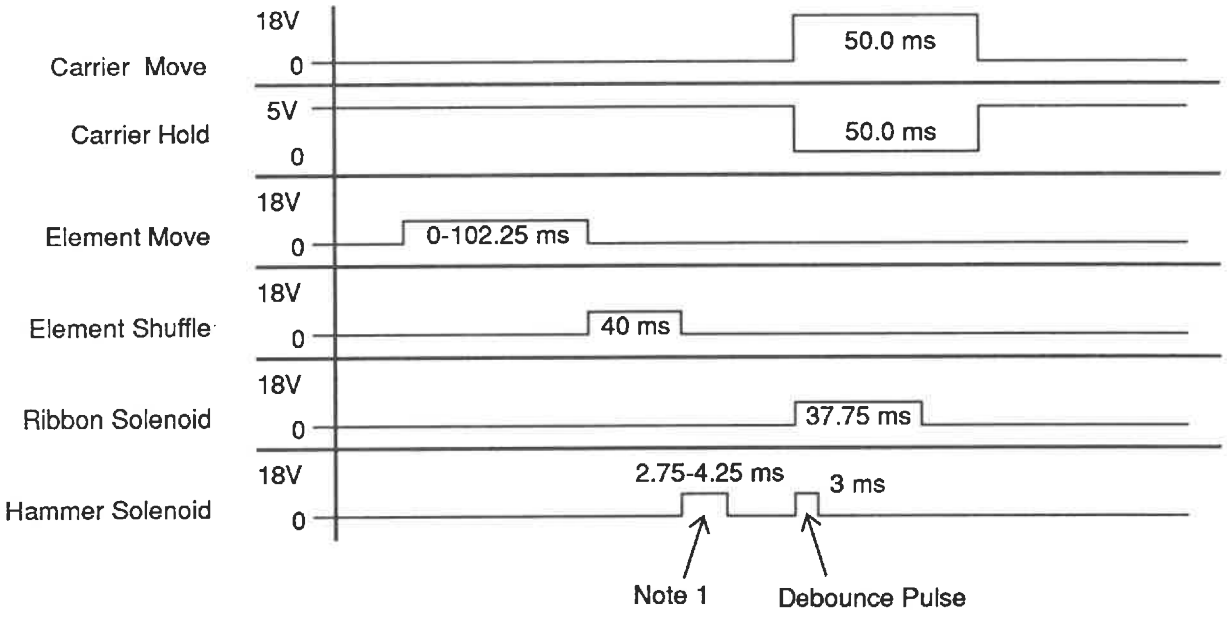
The Electronics determines from Keybutton depressed whether the feed should be Cassette Ribbon or Correction Ribbon. A brief sequence for each action follows:

A) **Cassette Ribbon** - the Element rotates to the selected character; the Hammer fires to print the character and trip the Ribbon mechanism for a Cassette Ribbon Feed; the Ribbon Solenoid energizes to feed the Cassette Ribbon; the Carrier moves right one space (see Print Cycle Chart below).

Note 1: When the Ribbon Solenoid is de-energized, the Ribbon mechanism returns to the Correction Lift and Feed position.
Note 2: The Ribbon advance during a Cassette Ribbon cycle is for the next printable character.

B) **Correction Lift & Feed** - the Carrier moves left to the character location; the Element rotates to the selected character; the Ribbon Solenoid energizes to lift and feed the Correction Ribbon, and the Hammer fires to transfer the character to the Correction Ribbon. The Ribbon Solenoid de-energizes, allowing the Correction Bail to drop to its normal position and the Ribbon mechanism to the Correction Lift and Feed position.

PRINT CYCLE -- SINGLE CHARACTER (10 PITCH)



NOTE 1:
LENGTH OF PULSE VARIES WITH THE PITCH SELECTED AND HAMMER ENERGY LEVEL.

12) Cassette Ribbon Feed Mechanism

When latched for Cassette Ribbon feed, the Cassette Ribbon Feed mechanism feeds Ribbon when the Ribbon Solenoid is energized. The top of the Ribbon Driver seats in the Drive Gear in the Ribbon Cassette. The bottom of the Ribbon Driver seats into the Ribbon Ratchet Hub which in turn fits over the Ribbon Feed Shaft. On the bottom of Ribbon Feed Shaft is an Anti-Backup Feed Spring which allows the Feed Shaft to rotate only in one direction.
After printing the previous character, the Ribbon Solenoid energizes and pulls the pawl of the Ribbon Feed Assembly in the teeth of the Ribbon Drive Ratchet Hub. This action rotates the Ribbon Feed Shaft, which rotates the Ribbon Driver approximately 30° for each printable character. The Cassette Ribbon is now positioned for the next printable character.

13) Correction Lift & Feed Mechanism

When the Ribbon mechanism is in its normal position, it is ready for a Correction Lift and Feed cycle. As the Ribbon Solenoid plunger is pulled into the Solenoid, the bottom of the Correction Bellcrank is pulled forward, moving the top tail upward, which causes the Correction Bail to lift upward. As the Bail raises, the Correction Feed Pawl ratchets over one tooth of the Correction Take-up Spool. When the Ribbon Solenoid Plunger is released, spring tension on the Bail returns all parts to rest. As the Bail lowers, the Feed Pawl engages a tooth in the Correction Take-up Spool to rotate the Take-up Spool one tooth past the Stop-Pawl to feed the Correction Ribbon.

14) Paper Feed

Driven by the Electronics, the Index Motor rotates clockwise and counterclockwise to drive the Platen and Rear Feed Rollers for Paper Feed.

The 12 tooth Index Motor Drive Gear meshes with the larger Gear of the Linespace Pinion. The smaller gear of the Linespace Pinion meshes with the 48 tooth Face Gear of the Platen Knob Shaft Assembly. The 47 tooth Spur Gear of the Platen Knob Shaft Assembly meshes with the 13 tooth Gear Drive Shaft. The Gear Drive Shaft connects to the right Rear Feed Roller through the Feed Roller Link. This series of gears provides the correct gear speed and torque to provide proper rotation of the Platen and the Rear Feed Rollers.

When the Electronics recognizes a Linefeed command, it energizes the Index Motor to rotate the Platen and the Rear Feed Rollers. The amount of paper indexed per linespace is determined by the operator's linespace selection (1, $1^1/_2$, or 2).

SECTION 3

LUBRICATION & CLEANING

INDEX

Subject	Page Number
General Lubrication Procedure	3-1
Cleaning Procedures	3-2
Lubrication Points	3-3 thru 3-6

GENERAL LUBRICATION PROCEDURE

The main illustration points for 5N Series Personal Word Processors are illustrated and listed beginning on page 3-3. Each lubrication point is indicated with an arrow and a circled reference number indicates the lubricant used at that point. The following lubricants are required:

Reference Number	Description	Part Number
1	Dow #200 Silicone	250254
2	VW-1222 Non-Fluid Oil	250299
3	Mobil FM2 Grease	250500
4	Anderol 465	250289
5	Dow #111 Silicone	250290
6	Never-Seez Grease	250293
7	NYOGEL	250262

Important: The following parts should be kept free of dirt, grease, and oil:

Control PC Board
Transformer
Disk Drive
LCD

CLEANING PROCEDURES

Cleaning procedures for machine parts and recommended cleaning solutions are outlined below.

Do not, under any circumstances, use an air hose or chemical cleaner to clean a Personal Word Processor. Debris and chemical residue can impair the function of electrical components. If an internal part requires cleaning, wipe that part clean with a clean, dry cloth.

Caution: When cleaning with recommended cleaning solutions, take care that no liquid drips or splashes onto internal parts. Keep all solvents and petroleum distillates away from electrical components.

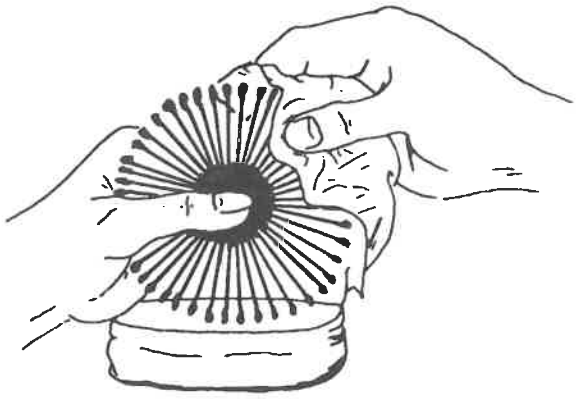
Platen

Remove Platen (see Removals). Soak a clean cloth with rubbing alcohol, and wipe the Platen surface to remove dust, dirt, and ink.

Note: If Platen is not removed, **do not** use alcohol. Use a household cleaner such as Windex.

Print Element

Dip the Print Element Petals into a container of rubbing alcohol, and wipe dry with a clean cloth. **Do not** soak the Print Element in the alcohol.

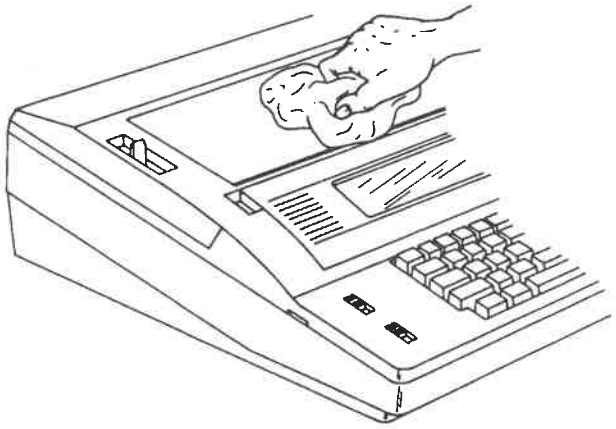


Jackets

Remove Jackets and wipe clean with a sponge soaked in a mild ammonia or soap solution. **Do not** use any cleaning solutions which contain chlorinated compounds.

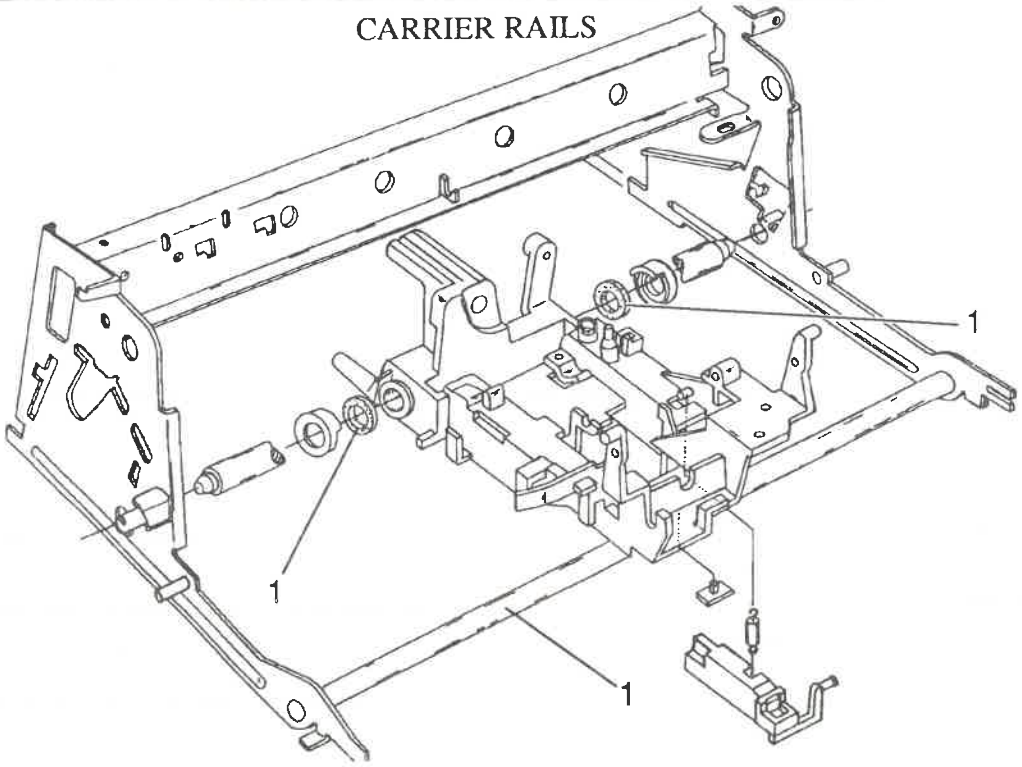
LCD

Use a soft camel hair artist's brush to remove dust. Use a soft dry cloth to remove smudges. **Do not** allow any liquid to come in contact with the LCD.

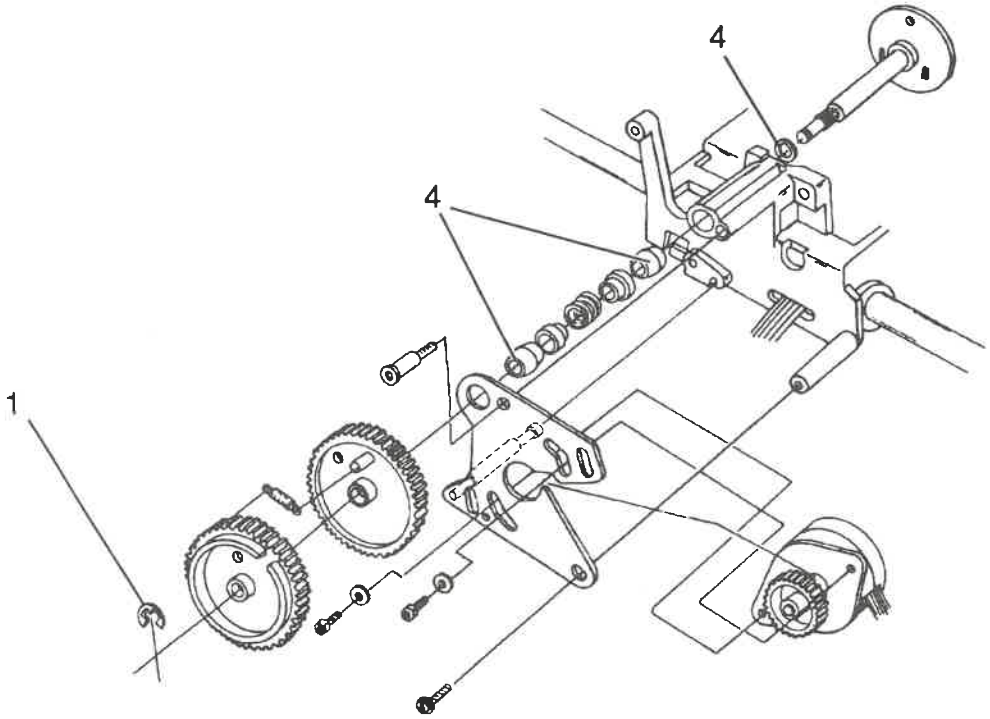


LUBRICATION POINTS

CARRIER RAILS



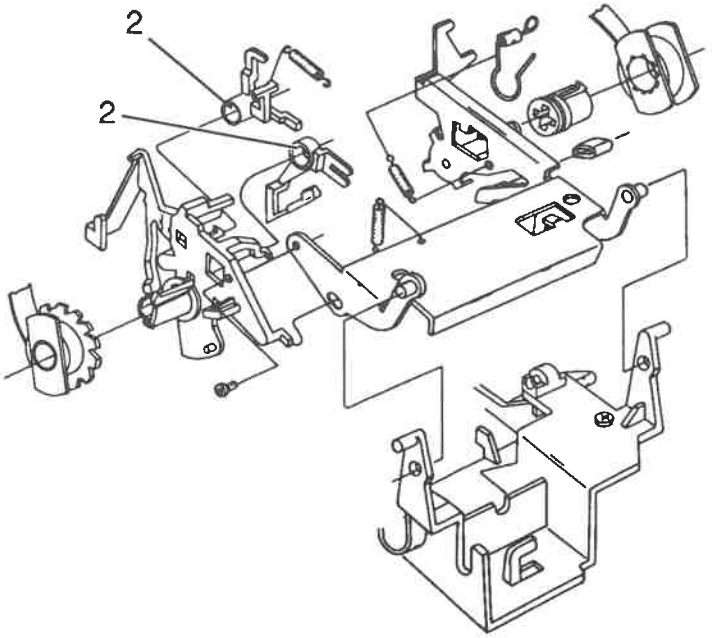
ELEMENT DRIVE



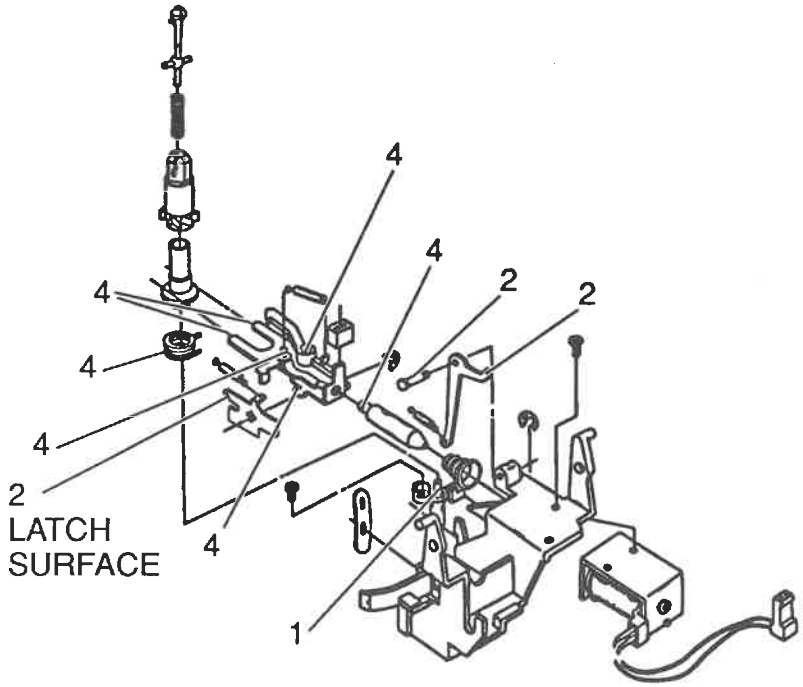
REF	DESCRIPTION	REF	DESCRIPTION
1	Dow #200 Silicone	4	Anderol 465
2	VW-1222 Grease	5	Dow #111 Silicone
3	Mobil FM2 Grease	6	Never-Seez Grease
		7	Nyogel

LUBRICATION POINTS

CORRECTION LIFT/FEED



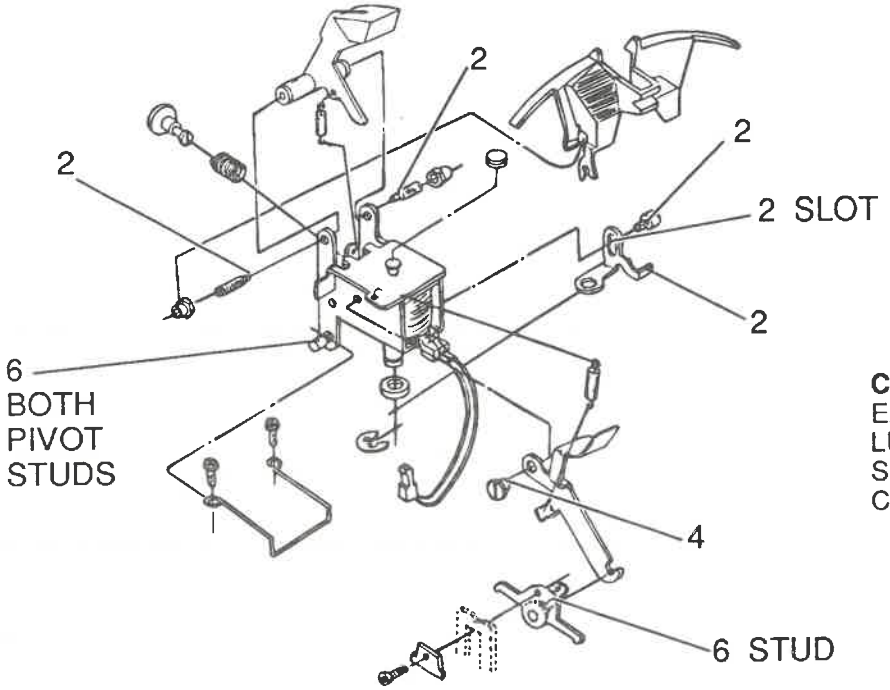
RIBBON DRIVE



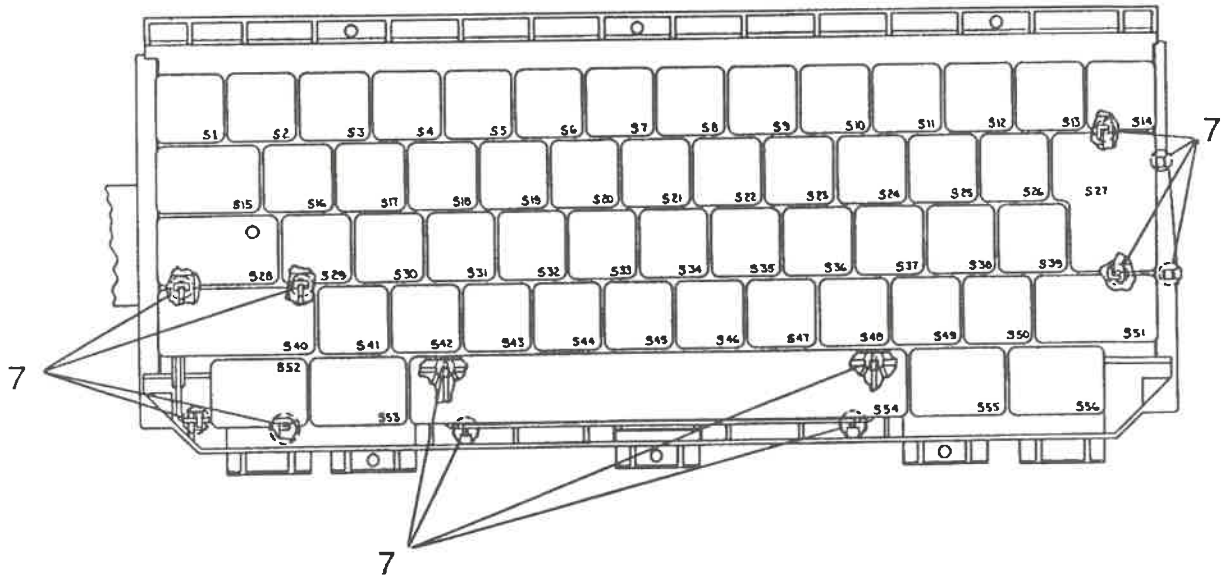
REF	DESCRIPTION	REF	DESCRIPTION
1	Dow #200 Silicone	4	Anderol 465
2	VW-1222 Grease	5	Dow #111 Silicone
3	Mobil FM2 Grease	6	Never-Seez Grease
		7	Nyogel

LUBRICATION POINTS

HAMMER



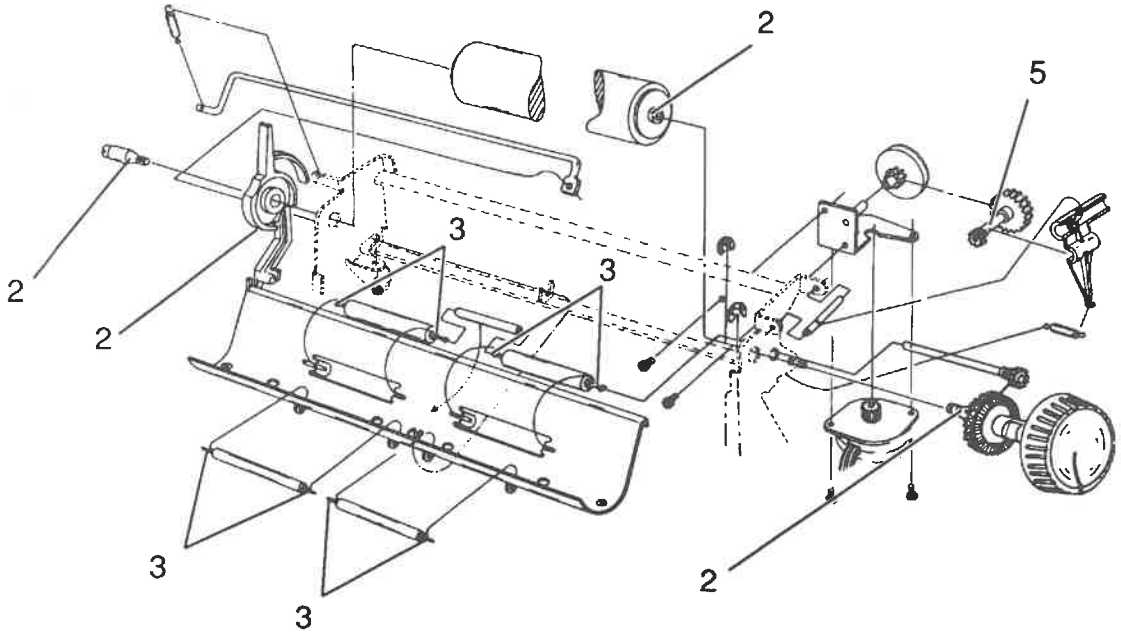
KEYBOARD



REF	DESCRIPTION	REF	DESCRIPTION
1	Dow #200 Silicone	4	Anderol 465
2	VW-1222 Grease	5	Dow #111 Silicone
3	Mobil FM2 Grease	6	Never-Seez Grease
		7	Nyogel

LUBRICATION POINTS

PAPER FEED



REF	DESCRIPTION	REF	DESCRIPTION
1	Dow #200 Silicone	4	Anderol 465
2	VW-1222 Grease	5	Dow #111 Silicone
3	Mobil FM2 Grease	6	Never-Seez Grease
		7	Nyogel

SECTION 4

REMOVALS

General Procedure: All removals should be performed with power cord unplugged and machine at rest. Prior removal of particular groups of parts is indicated in each removal procedure as required.

When adjustments are broken during a removal, those adjustments are indicated at the bottom of the procedure, and are referenced to adjustment numbers in the Adjustment Section. Refer to the Branch Display on page 5-1 for sequential relationships among adjustments.

OBSERVE STATIC PRECAUTIONS

Removals of PC Boards and other static sensitive parts are marked as above. Be extremely careful when handling these parts as static electricity can cause irreparable damage to static sensitive devices. Refer to the reverse side of the Contents Page (page ii) for proper procedures to follow when handling static sensitive devices.

Removals Index

		Page Number
1.	Mask Assembly Removal	4-3
2.	LCD Removal	4-4
3.	Mask Switches Removal	4-5
4.	Keyboard Removal	4-5
5.	Keyboard Component Removals	4-6
6.	Keyboard Keybutton Removal	4-6 - 4-8
7.	Control PC Board Removal	4-8
8.	Transformer Assembly Removal	4-9
9.	Disk Drive Removal	4-9
10.	Frame Assembly Removal (with Carrier & Paper Handling)	4-10
11.	Correction Bail Removal	4-11
12.	Correction/Cassette Ribbon Solenoid Removal	4-11
13.	Ribbon Mechanism Removal	4-12
14.	Hammer Solenoid Assembly Removal	4-13
15.	Element Motor Removal	4-13
16.	Element Drive Shaft and Bearings Removal	4-14
17.	Platen and Paper Table Removal	4-15
18.	Linespace Motor Removal	4-15
19.	Carrier Motor and Carrier Rack Drive Assembly Removal	4-16
20.	Carrier Molding Removal	4-17
21.	Forward Pivoting Paper Bail Removal	4-18

1. Mask Assembly Removal

1. Raise LCD and remove two Screws (1).

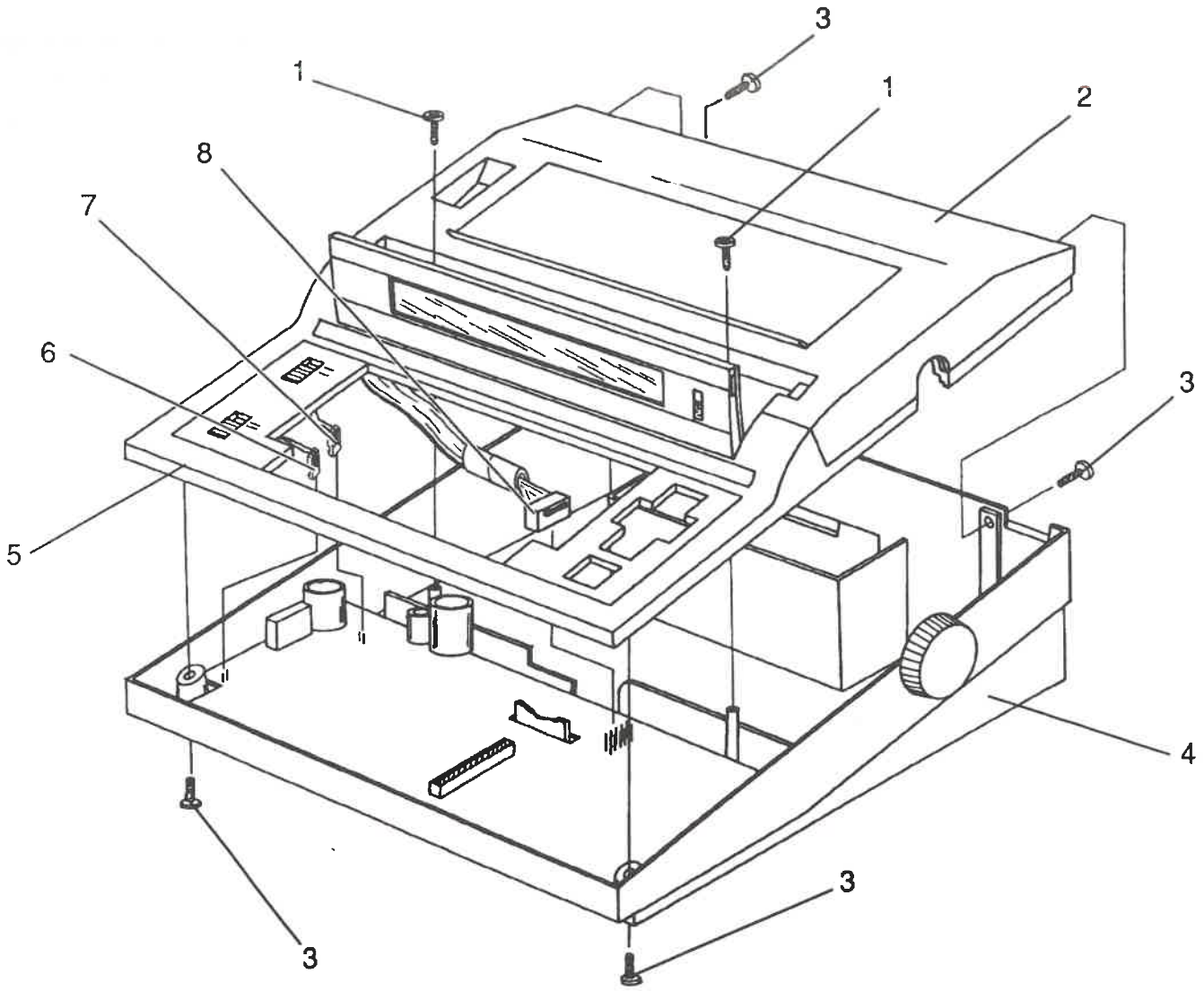
2. Remove four Screws (3).

3. Open Deck (2) and reach under Mask (5) to disconnect Power Switch Connector (6), Mode Switch Connector (7), and LCD Cable Connector (8) from Control PC Board.

4. Lift off Mask (5). Note: Deck (2) can be snapped off of Mask.

5. Remove Keyboard, Control PC Board, Frames, Disk Drive, and Transformer Assembly (see Removals Index) to remove Casing Base (4).

Replacement: Reverse procedure.



2. LCD Removal

1. Remove Mask Assembly (see Removals Index).

2. Lower LCD Housing, turn Mask (9) upside down and remove two Screws (6).

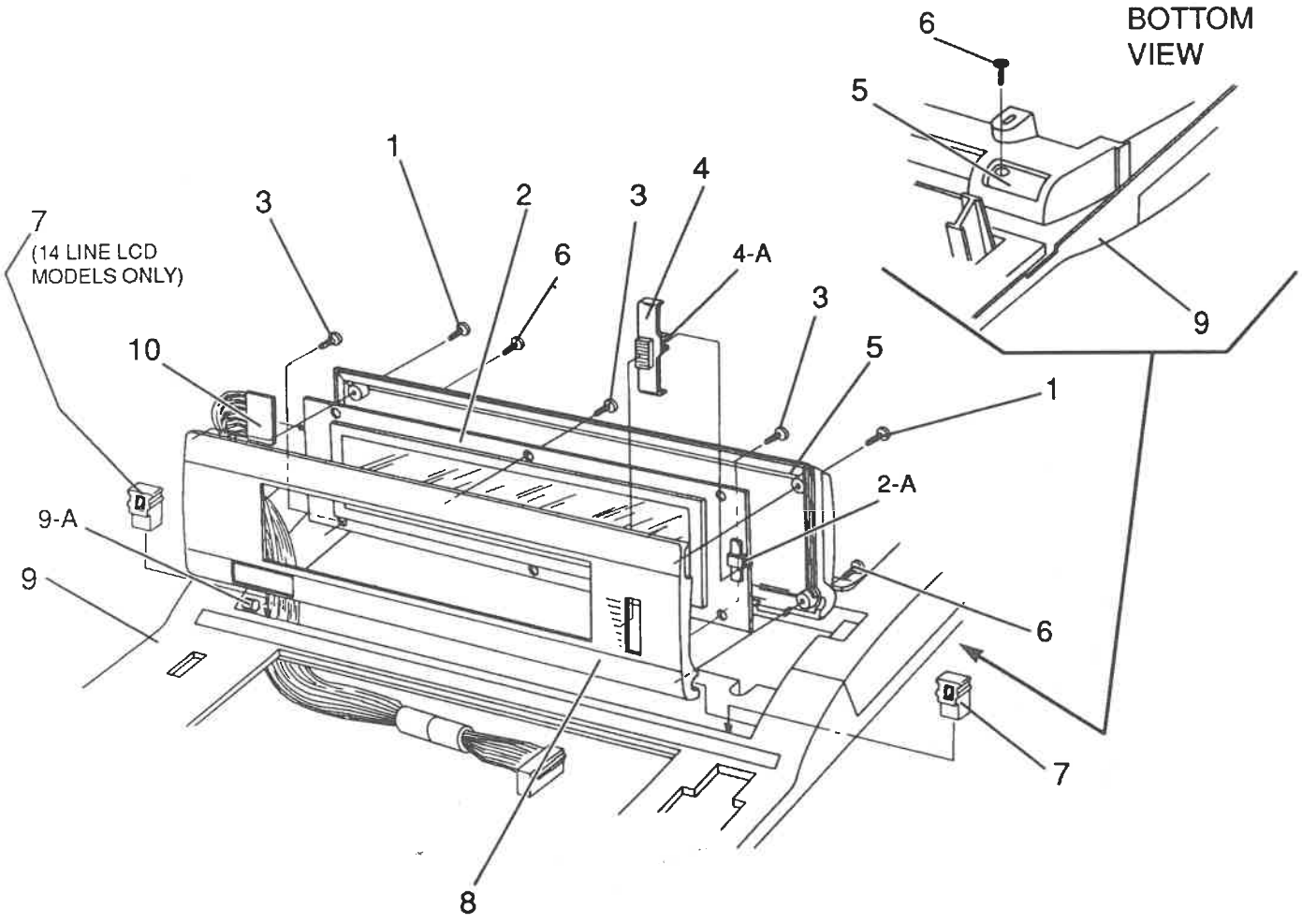
3. Turn Mask right side up and remove two Screws (1).

4. Remove Lower LCD Housing (5).

5. Disconnect LCD Connector (10).

6. Remove three Screws (3) to remove LCD (2) and Upper LCD Housing (8). Contrast Control Slider (4) will drop free, and LCD Housing Brake (7) may be removed from Mask. Note: Models with 14 Line LCD also use LCD Housing Brake (7) on Left Side of Mask.

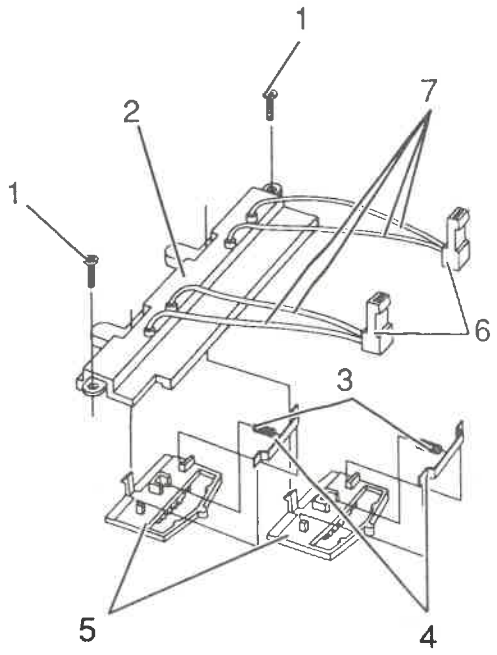
Replacement: Reverse procedure. Note: Make sure Slider Notch (4-A) engages LCD Contrast Control Tab (2-A) and that Upper and Lower LCD Housings are assembled to Left and Right Mask Pivots (9-A).



3. Mask Switches Removal

1. Remove Mask and turn upside down (see Mask Removal).
2. Remove Screws (1) to remove Switch Actuator Plate Assembly (2).
3. A) Remove Switch Actuator (5), Spring (3), and Sliding Contact (4) from Switch Actuator Plate (2).
   B) Remove second Switch Actuator (5), Spring (3), and Sliding Contact (4) from Switch Actuator Plate (2).
4. Remove Connectors (6) from Wires (7) and feed wires out Switch Actuator Plate (2). The Wires include the Splice Bands which make contact with the Sliding Contact (4).

Replacement: Reverse procedure.
Note: Make sure Electric Lead with Splice Band is fully seated in Switch Actuator Plate (2).

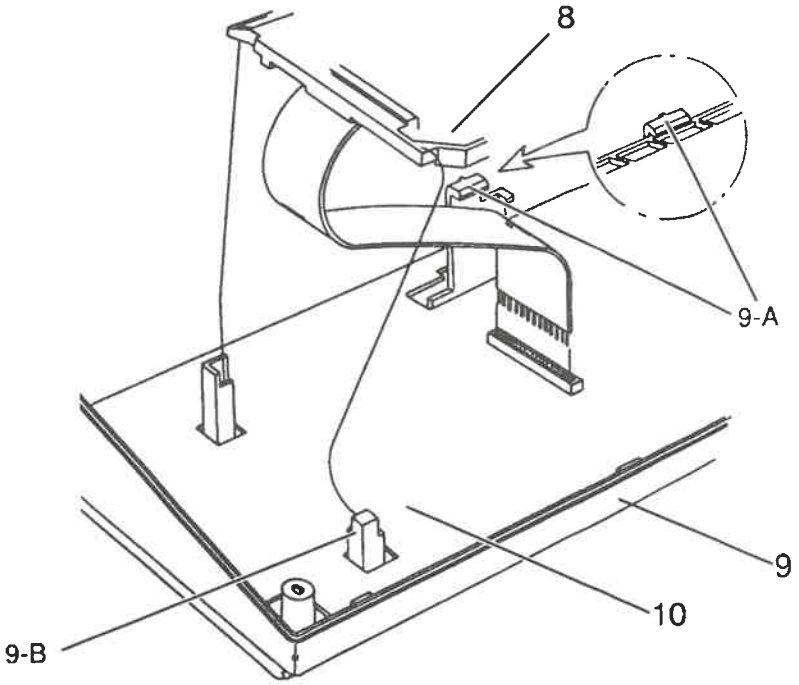


OBSERVE STATIC PRECAUTIONS

4. Keyboard Removal

1. Remove Mask Assembly (see Mask Removal).
2. Unsnap rear of Keyboard (8) from Center Post (9-A).
3. Lift Rear of Keyboard (8) up and slide Keyboard rearward from front Posts (9-B). Disconnect the Ground Cable from Keyboard and disconnect the Keyboard Connector from Control PC Board (10). Remove Keyboard.

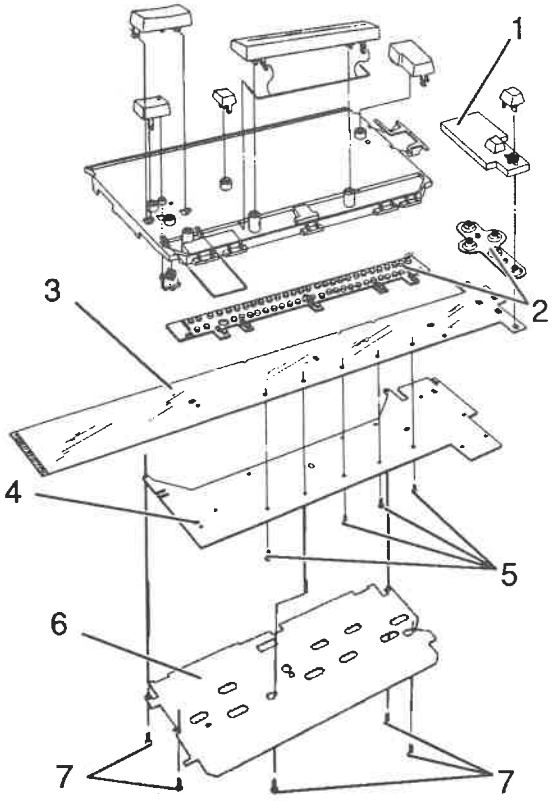
Replacement: Reverse procedure.



5. Keyboard Component Removals

1. Remove Mask and Keyboard (see Removals Index).
2. Turn Keyboard upside down (Keybuttons facing down). **International Models:** Remove Screws (7) and Keyboard Cover Plate (6). Remove Screws (5) and lift off Keyboard Base Plate (4). Cursor Keypad (1) will fall free.
3. Lift off Keyboard Flexible Circuit (3) and Molded Switches (2) from Keyboard.
4. **Keybutton Removals:** The Keybuttons on the Keyboard **cannot** be removed by prying up the Keybutton. See the procedure on pages 4-4 through 4-6.

   Replacement: Reverse procedure.



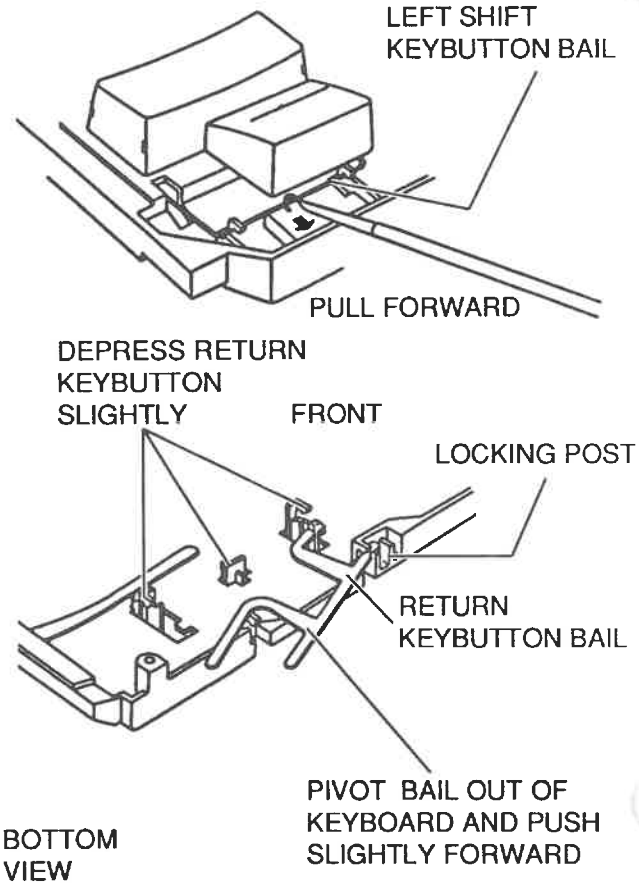
Caution: Prying up on a Keybutton damages the Striker Spring. If a Striker Spring gets damaged, the entire Keyboard must be replaced.

6. Keyboard Keybutton Removal

1. Remove the Keyboard from the Casing Base. Removal of the Keyboard Base Plate is not necessary, but the illustrations in this procedure show it removed.
2. When removing the Spacebar, Left Shift, or Return Keybutton, remove the Keybutton Bail next:

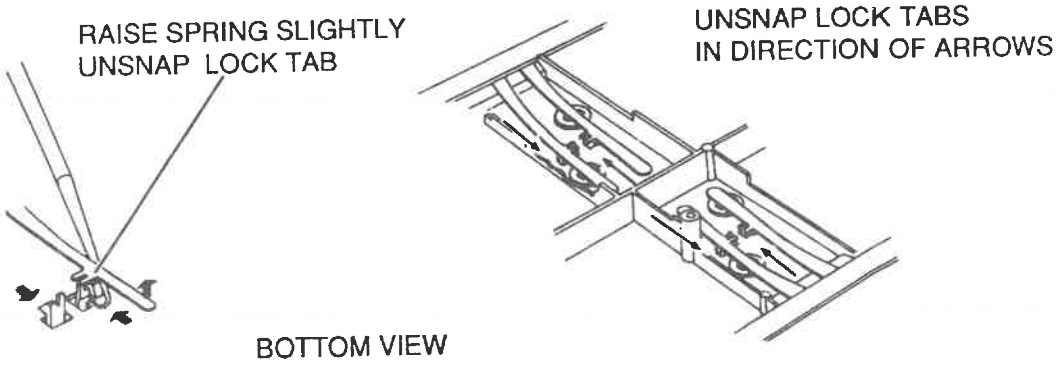
   A) For the Spacebar or Shift Keybutton, use a Spring Hook on the Wire Bail, and pull forward to disengage the Bail from the Keyboard and Keybutton.

   B) For the Return Keybutton, depress the Keybutton slightly; push gently forward on the Sheet Metal Bail, and pivot the Bail out of the Keyboard. Be careful not to damage the locking post when pushing the bail forward.



6. Keyboard Keybutton Removals (continued)

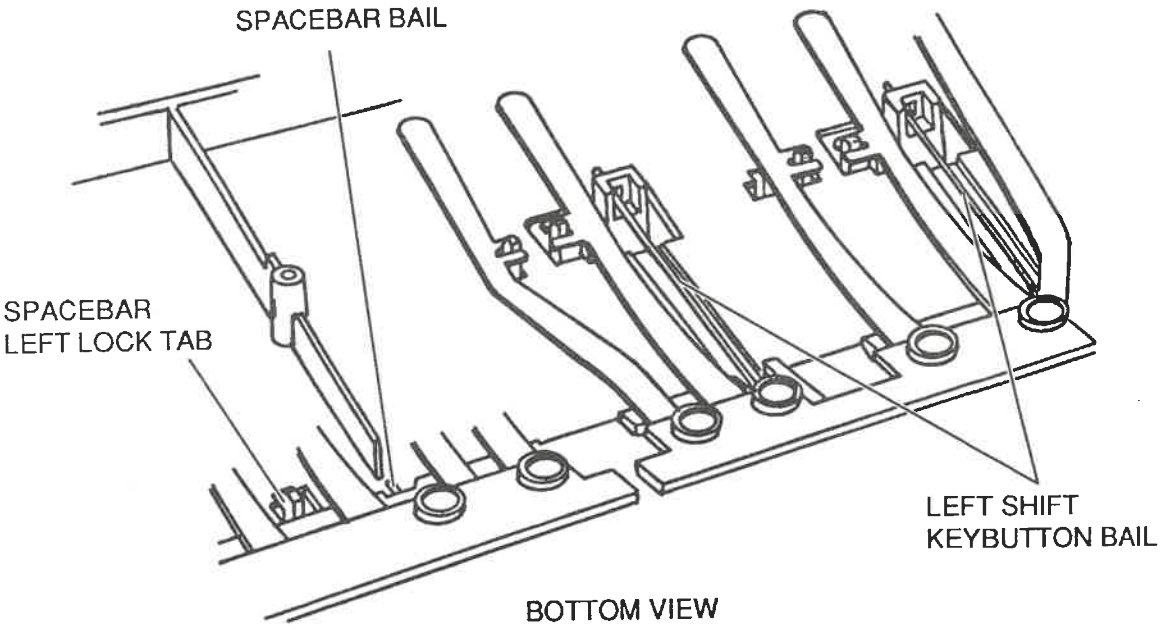
3. Turn the Keyboard upside down, and use a Spring Hook to raise the Striker Spring slightly to disengage it from the Keybutton. ***Caution: Do not raise the striker spring too far or the spring will get damaged.*** While holding the Spring away from the Keybutton, use the Spring Hook to unsnap the Keybutton Lock Tab from the Keyboard. The Keybutton drops out of the Keyboard Assembly. Note: The Spacebar has *two* Lock Tabs, and Cursor Keypad Keybuttons **do not** use Striker Springs.



Replacement:

A) Align the Keybutton with the holes in the Keyboard, and snap the Keybutton in place.

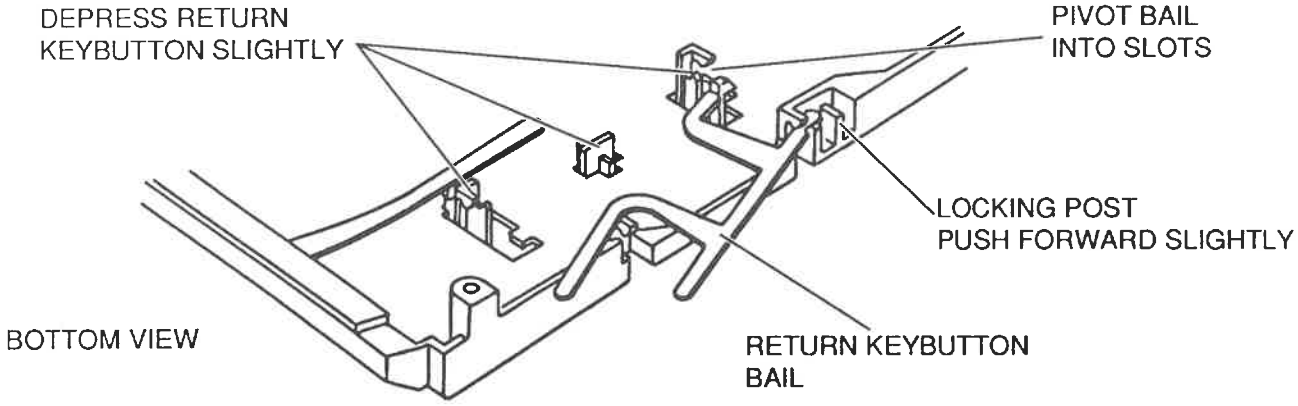
B) 1. When replacing the Spacebar or Left Shift Key Wire Bail, insert the Bail through the holes in the Keyboard. Make sure the ends of the Bail are properly aligned, and snap the front of the Bail into its locking tabs.



6. Keyboard Keybutton Removals

Replacement (continued):

B) 2. When replacing the Return Keybutton Sheet Metal Bail, depress the Keybutton slightly; gently push the end of the Bail slightly against the Keyboard post, and pivot the Bail into position. Make sure the Arms of the Bail seat in the Slots on the Keybutton.



C) Replace the Keyboard in the Casing Base.

7. Control PC Board Removal

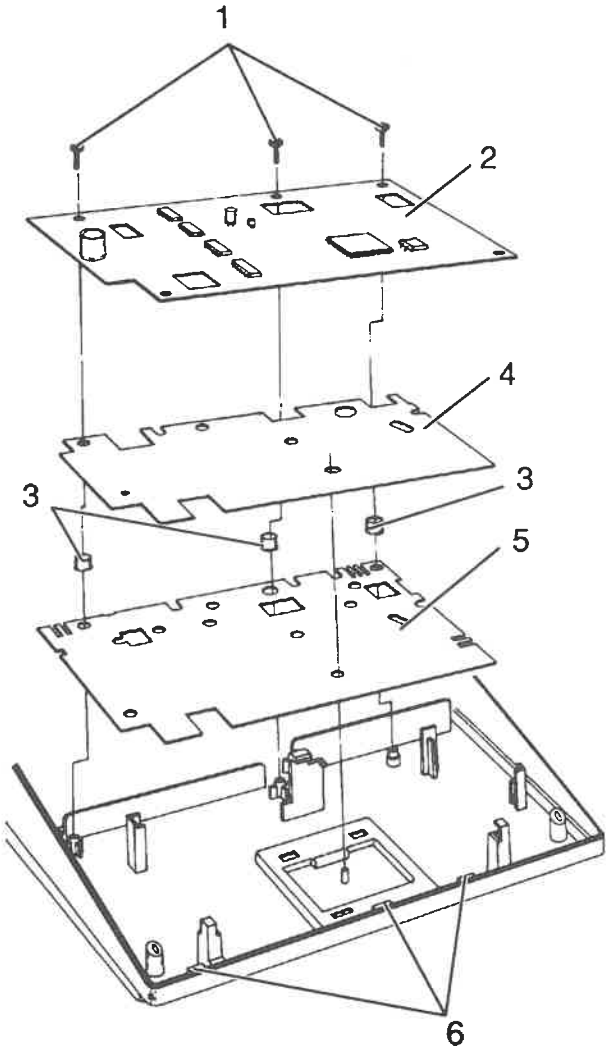
1. Remove Mask Assembly and Keyboard (see Removals Index).

2. Disconnect all Connectors from Control PC Board.

3. Remove Screws (1), and lift out Control PC Board (2).

4. Standoffs (3), Insulator (4), and Ground Shield (5) may be lifted out of Casing Base.

Replacement: Reverse procedure. Note: Make sure front of PC Board is under Lugs (6). Refer to Wiring Diagram for connections to PC Board.

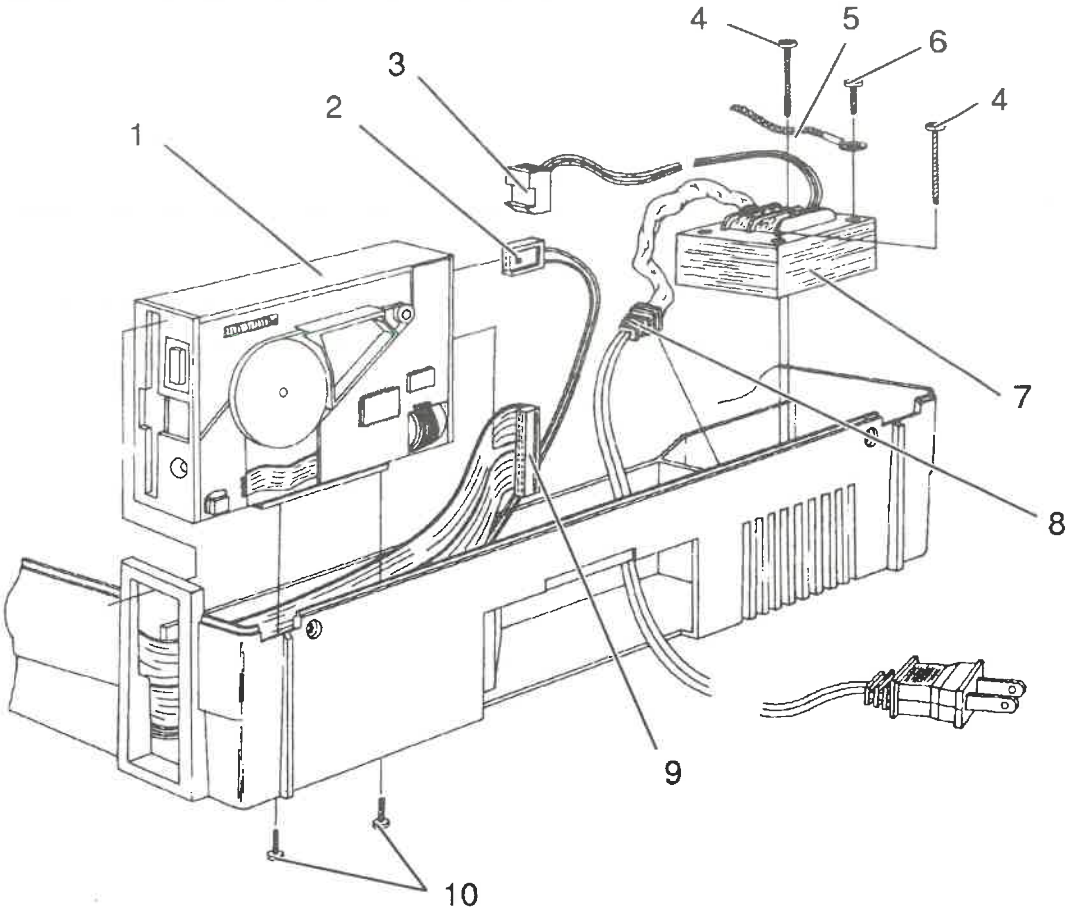


8. Transformer Assembly Removal

1. Remove Mask Assembly (see Removals Index).
2. Disconnect Connector (3) from Control PC Board.
3. Remove two Screws (4) from Transformer (7).
4. Remove Screw (6) and Ground Wire (5) from Transformer (7).
5. Lift out Line Cord Strain Relief (8) from Casing Base, and lift out Transformer Assembly (7).

Replacement: Reverse procedure. Note: Transformer fits on Keyed Studs in Casing Base.

OBSERVE STATIC PRECAUTIONS



9. Disk Drive Removal

1. Remove Mask Assembly (see Removals Index).
2. Remove two Screws (10).
3. Disconnect Disk Drive Power Connector (2) and Disk Drive Connector (9) from Disk Drive (1), and lift out Disk Drive.

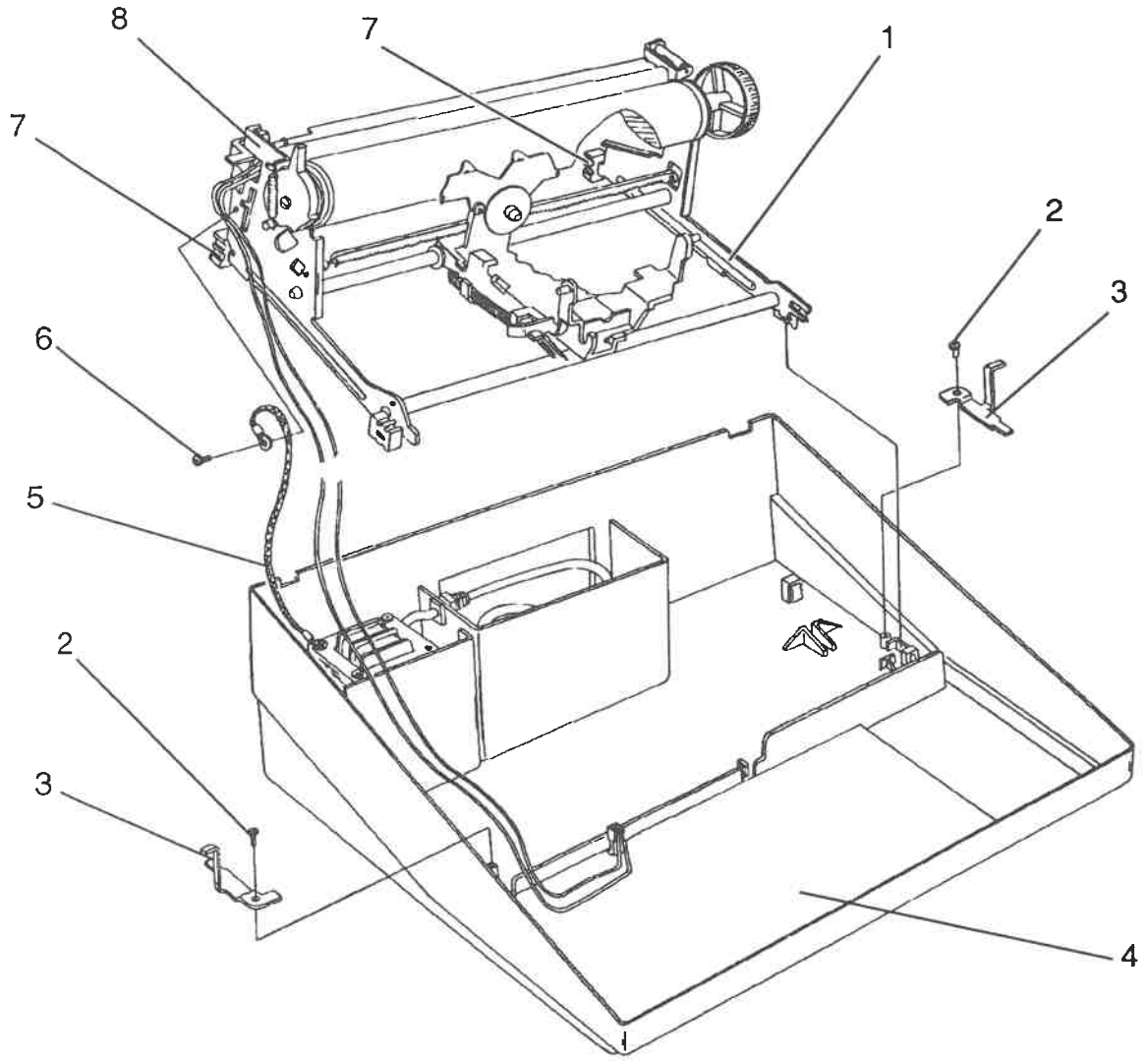
Replacement: Reverse procedure. Note: Replace Disk Drive so that Power Connector (2) is at the top of Disk Drive (1).

10. Frame Assembly Removal (with Carrier & Paper Handling)

1. Remove Mask Assembly and Keyboard (see Removals Index).
2. Remove two Screws (2) and two Foot Retainers (3) from Casing Base (4).
3. Disconnect Left End Switch, Ribbon Solenoid, Hammer Solenoid, Element Motor, Carrier Motor, and Linespace Motor Connectors from Control PC Board.
4. Remove Spiral Harness, Left End Switch, and Index Motor Wires from Casing Base.
5. Lift front of Frame Assembly to remove Screw (6) and Ground Cable (5).
6. Lift Frame Assembly (8) out of Casing Base (4). Note: This requires some force since the fit is tight. The two rear Feet (7) of the Frames can remain in the Casing Base.

Replacement: Reverse procedure. Note: Refer to Wiring Diagrams for connections to the Control PC Board.

OBSERVE STATIC PRECAUTIONS



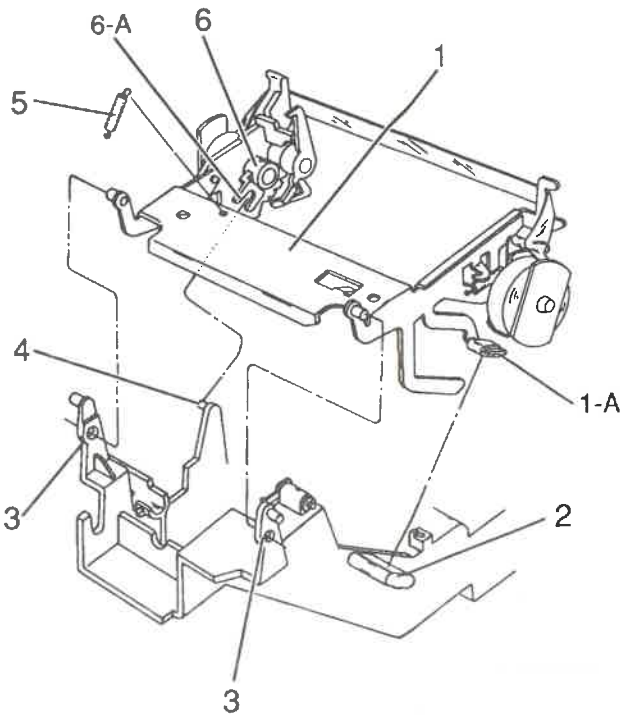
11. Correction Bail Removal

1) Remove Print Element and Ribbon Cassette. Correction Ribbon may be left in place.

2) Unhook Spring (5) from Correction Bail (1).

3) Remove Correction Bail from Carrier by pushing out on Ribbon Cassette Pivot Mounts (3). Note: Correction Feed Arm (6) may drop off.

Replacement: Reverse procedure. Note: Make sure Fork (6-A) of Correction Feed Arm engages Stud (4), and that Downstop Tail (1-A) is on top of Bail Downstop (2) on Carrier.



12. Correction/Cassette Ribbon Solenoid Removal

1) Remove Frame Assembly and Correction Bail (see Removals Index).

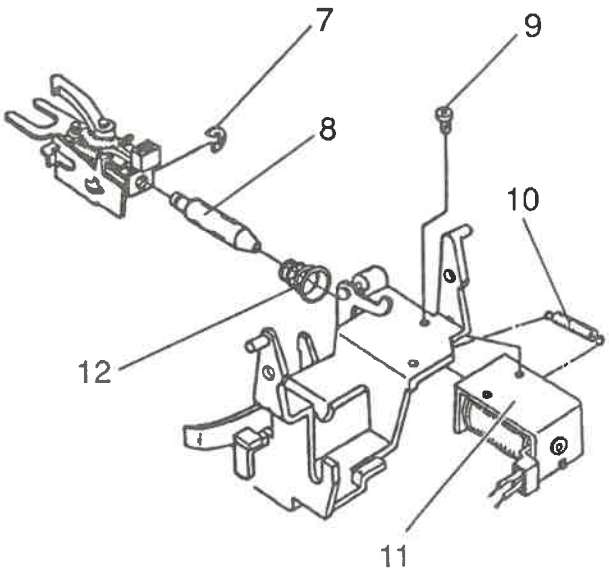
2) Unhook Spring (10) from Ribbon Solenoid (11).

3) Remove Screw (9) and lift out Solenoid.

4) Remove E-Ring (7) from Solenoid Plunger. Lift out Plunger (8) and Spring (12).

Replacement: Reverse procedure. Note: Make sure Solenoid Spring (12) is installed as shown in illustration, and that Spring (10) is in "V" Slot of Ribbon Solenoid.

Adjustments Broken: Correction Ribbon Lift Adjustment (Adjustment #6).



13. Ribbon Mechanism Removal

Note: Ribbon Driver (1) may be removed from Ribbon Driver Assembly with no other removals by pulling it straight up out of Assembly with a pair of Needle Nose Pliers. Spring (2) may fall free. Use Needle Nose Pliers to replace Ribbon Driver (1).

1. Remove Frame Assembly, Correction Bail, and Correction/Cassette Ribbon Solenoid (see Removals Index).

2. Remove Screw (10), E-Ring (8), Stud (6), and Correction Lift Bellcrank (7).

3. Lift out Ribbon Shaft Assembly from Carrier Molding (9).

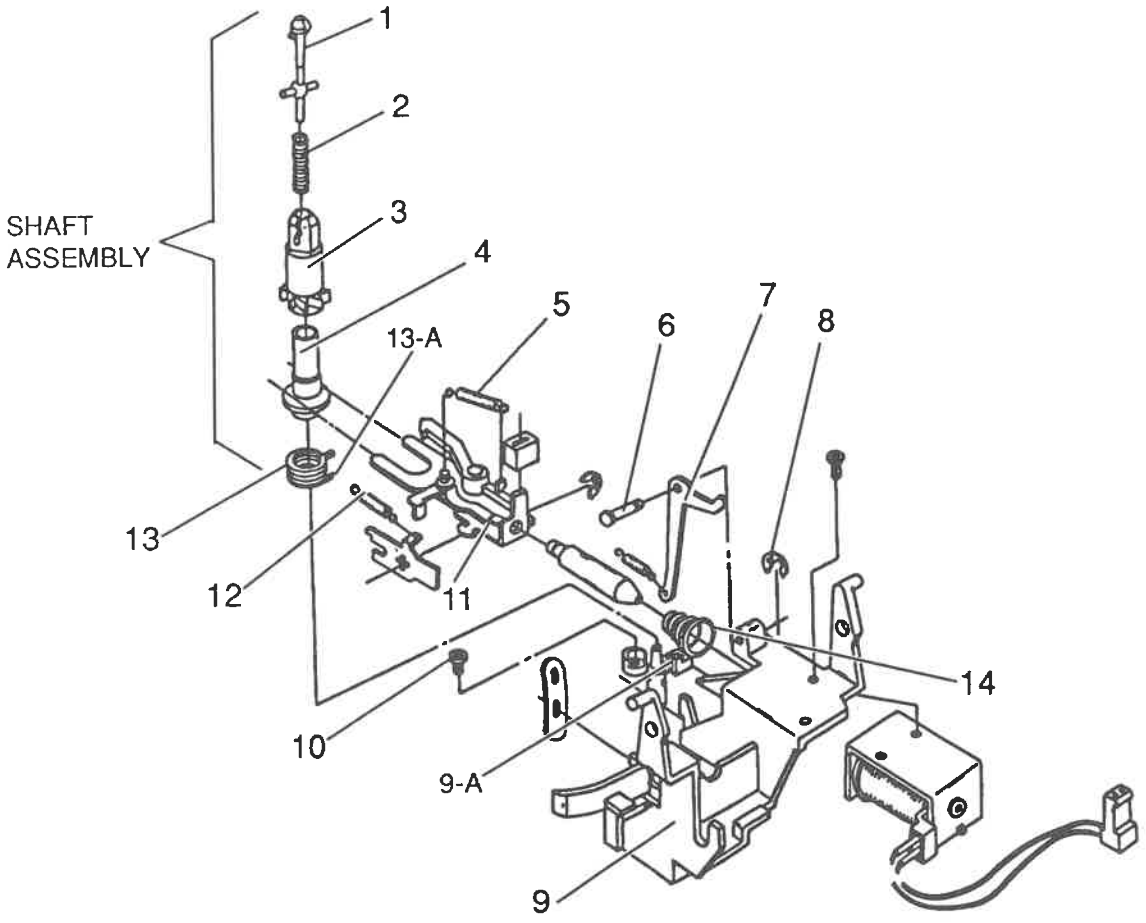
4. Remove Ribbon Drive Ratchet Hub (3) from Ribbon Feed Shaft (4) by pulling apart.

5. Remove Anti-Backup Feed Spring (13) from Ribbon Feed Shaft (4).

6. Remove Ribbon Feed Spring (5) and Black Latch Spring (12) from Ribbon Feed Assembly (11).

Replacement: Reverse procedure. Note: Spring Tab (13-A) seats in molded Notch (9-A) in Carrier Molding (9). Also, make sure Solenoid Spring (14) is installed as shown in illustration.

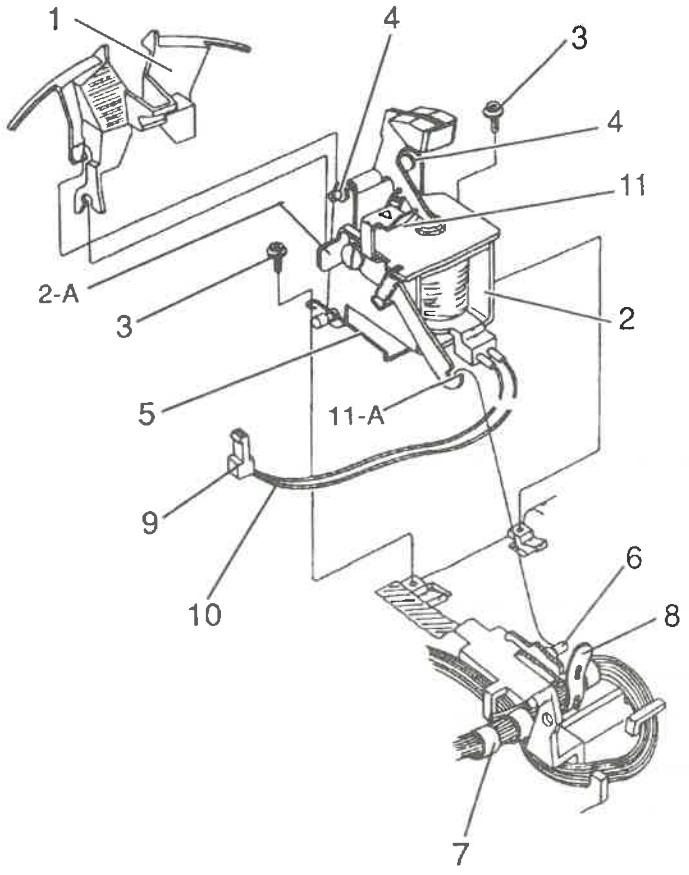
Adjustments Broken: Correction Cassette Lift Adjustment (Adjustment #6).



14. Hammer Solenoid Assembly Removal

1. Remove Correction Bail (see Removals Index).
2. Remove Ribbon Guide (1) from left and right Hammer Pivot Nuts (4) and Ear (2-A).
3. Unhook Wire Strap (8) from Carrier.
4. Remove two Screws (3) and Retaining Wire (5).
5. Press Push Lever (11) downward slightly, and lift Hammer Solenoid Assembly (2) out of Carrier.
6. Remove two Hammer Wires (10) from spiral Wire Binder Retainer (7).
7. Disconnect Hammer Solenoid Connector (9) from Control PC Board.

Replacement: Reverse procedure. Note: Formed area of Retaining Wire fits under Lip of Carrier Molding, and Stud (6) fits in Slot (11-A).



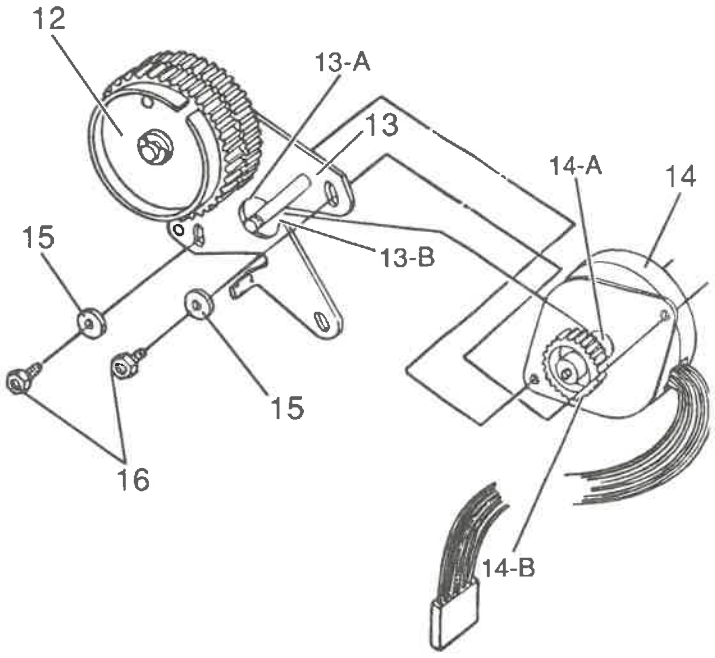
15. Element Motor Removal

1. Remove Frame Assembly (see Frame Assembly Removal).
2. Remove two Screws (16) and two Washers (15).
3. Push Element Motor (14) forward to disengage Bearing (14-A) from Hole (13-A) in Motor Bracket (13), and slide Motor out through Slot (13-B).

Replacement:

A) Wind Element Scissor Gears (12) against spring tension and hold Gears.

B) Slide Element Motor (14) through Bracket Slot (13-B), and push Motor (14) rearward so Bearing (14-A) seats in Bracket Hole (13-A) while making sure Drive Gear (14-B) meshes with Scissor Gears (12). Release Scissor Gears after Bearing is seated and Gears are meshed. Hold Element Motor in place and reinstall two Washers (15) and two Screws (16).



Adjustments Broken: Element Motor Position (Adjustment #1).

16. Element Drive Shaft and Bearings Removal

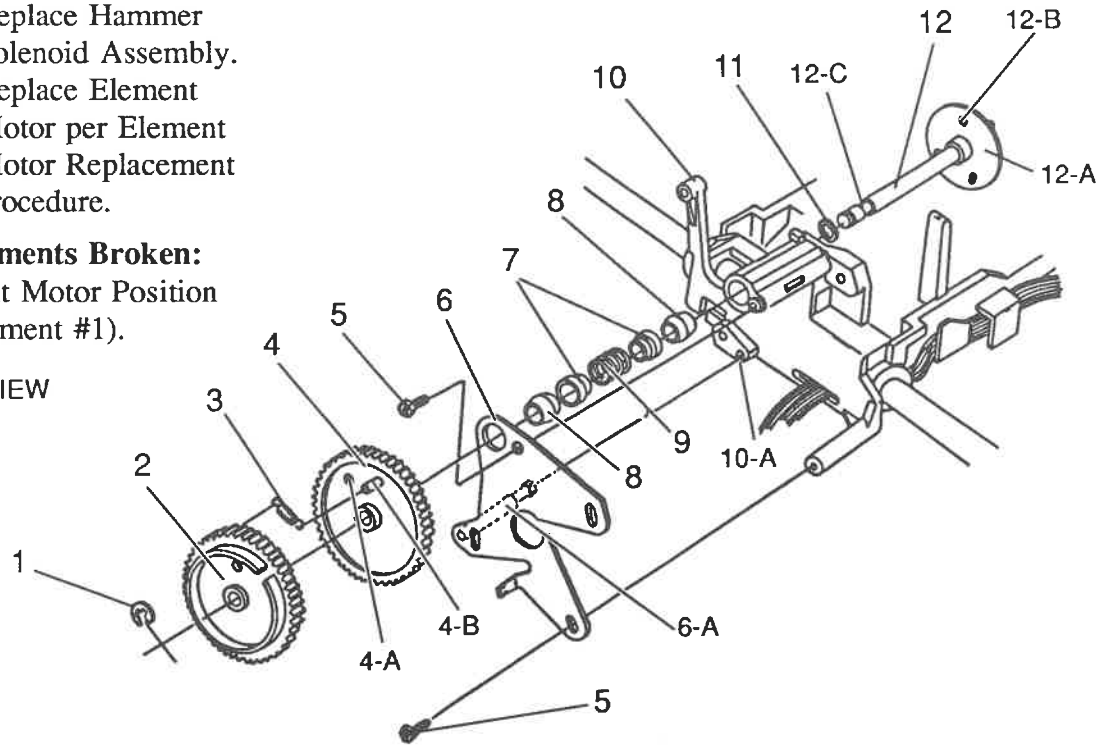
1. Remove Element Motor and Hammer Solenoid Assembly (see Removals Index).
2. Remove E-Ring (1), Outer Scissor Gear (2), and Spring (3).
3. Pry off Inner Scissor Gear (4). Note: This Gear must be replaced with a new one after prying it off.
4. Remove two Screws (5).
5. Pivot Stud (6-A) out of Slot (10-A) in Carrier Molding (10), and remove Bracket (6), Bearing Retainers (7), Bearings (8), Spring (9), Washer (11), and Element Drive Shaft Assembly (12). ***Caution: Carefully remove Bracket (6) to overcome Spring (9) tension.***

Replacement:

A) Insert Element Drive Shaft (12) with Washer (11) through Drive Shaft Hole in Carrier Molding (10).
B) Reassemble Bearings (8), Spring (9), Bearing Retainers (7), and Bracket (6) on Drive Shaft. Note: Smaller diameter of Bearings (8) fit into Retainers (7). Shoulder End of Retainers (7) seats in Spring (9).
C) Replace two Screws (5).
D) Rotate Drive Disc (12-A) so that Round Hole (12-B) is at 12 o'clock position. Hold new Inner Scissor Gear (4) with Hole (4-A) at about 11 o'clock position as viewed from the rear (arrow molded inside gear should be parallel with the Rear Frame crosspiece), and press Gear onto Drive Shaft until it bottoms on Drive Shaft Shoulder (12-C). Note: This positioning assures that Element Motor will be within adjustment range when reassembled.
E) Assemble Spring (3) to Inner Gear Spring Anchor (4-B) with other Spring Loop facing Hole (4-A). Place Outer Gear (2) on Shaft (12), hook Spring Loop with Outer Gear Spring Anchor, and twist Gears until Spring Anchors fit in Gear Holes: Assemble E-Ring (1).
F) Replace Hammer Solenoid Assembly.
G) Replace Element Motor per Element Motor Replacement procedure.

Adjustments Broken:
Element Motor Position (Adjustment #1).

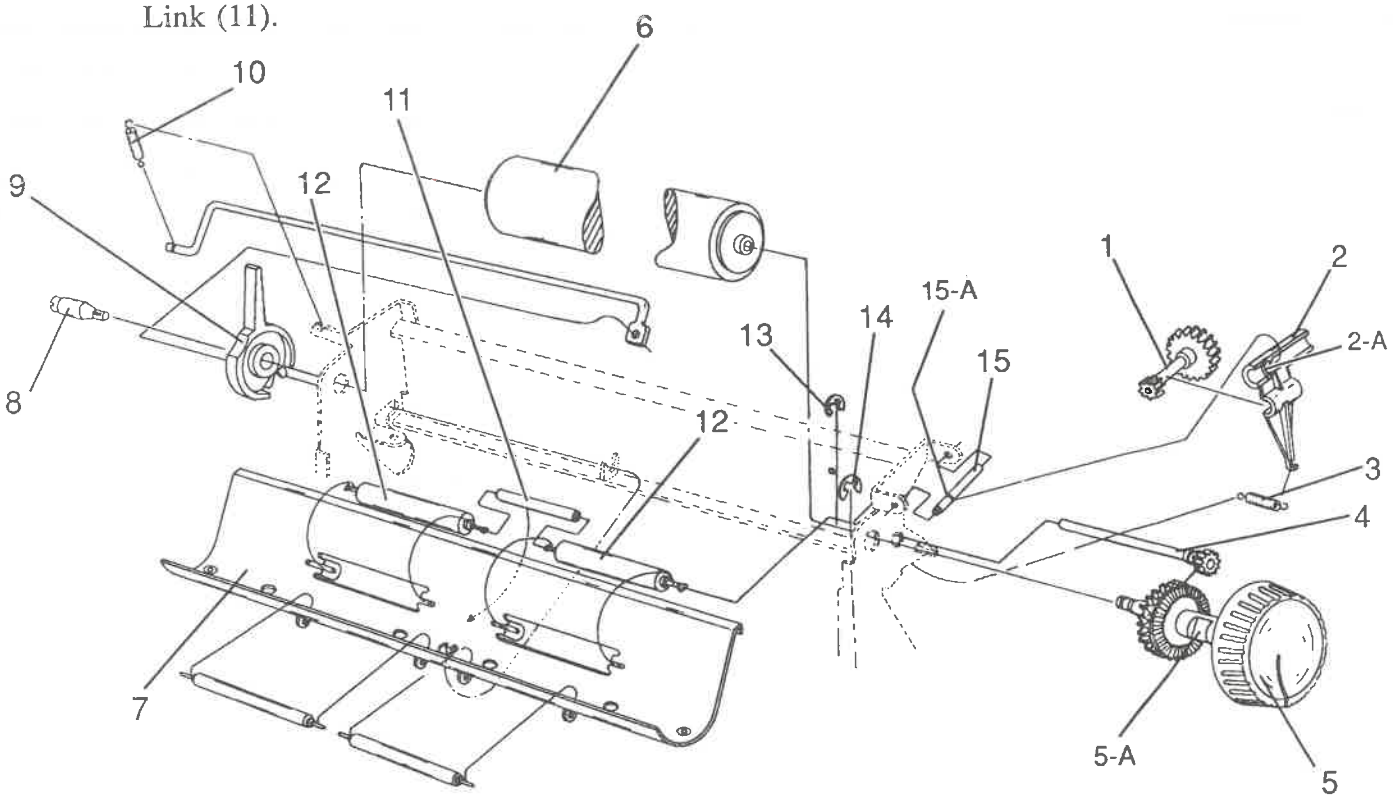
REAR VIEW



17. Platen and Paper Table Removal

1. Remove Mask and Frame Assembly (see Removals Index).
2. Unhook Spring (3) from Linespace Pinion Pivot (2). Remove Pivot (2) and Linespace Pinion Assembly (1). Note: Pin (15) may fall free.
3. Pivot Paper Bail forward, unhook Spring (10) and remove Paper Release Lever (9).
4. Remove E-Ring (14).
5. Hold Platen Knob (5) with a 3/8" wrench over square portion of Knob Shaft (5-A) and remove Screw (8). Note: If you simply hold right Platen Knob, it will likely break when loosening Screw (8).
6. Hold Platen (6) and remove Platen Knob (5).
7. Disengage Right Rear Feed Roller (12) from Drive Shaft (4), and lift out Platen (6) and Paper Table (7).
8. Remove E-Ring (13) and Drive Shaft (4).

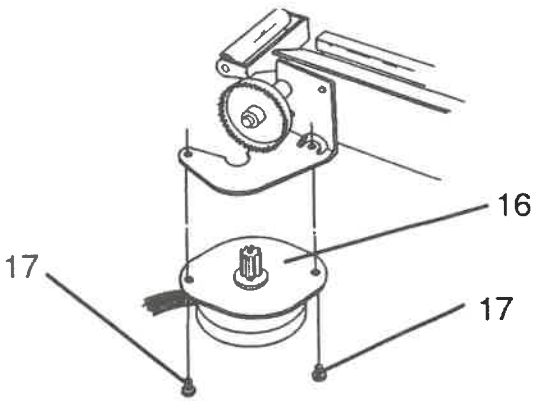
Replacement: Reverse procedure. Note: Formed Tab in Paper Table seats in Hole of Paper Release Shaft, and Flange (2-A) in Pinion Pivot seats in Groove (15-A) of Pin. Flat surfaces of Feed Rollers (12) seat in Slots of Drive Shaft (4) and Roller Link (11).



18. Linespace Motor Removal

1. Remove Mask and Frame Assembly (see Removals Index).
2. Remove two Screws (17) and lift out Linespace Motor (16).

Replacement: Reverse procedure. Note: Make sure Motor Gear meshes with Intermediate Gear.

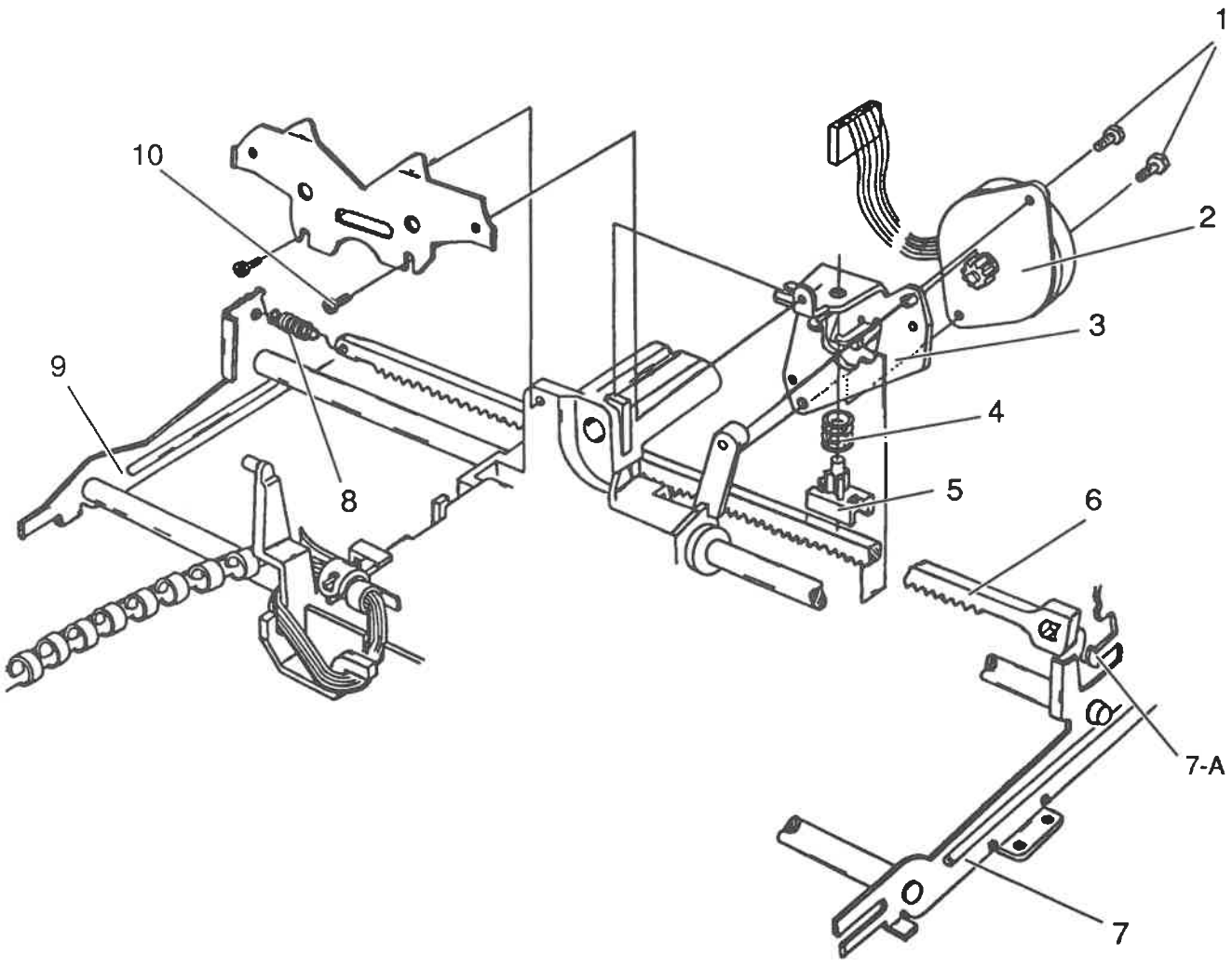


19. Carrier Motor and Carrier Rack Drive Assembly Removal

1. Remove Frame Assembly with Carrier Molding (see Removals Index).
2. Remove right Line Indicator Screw (10).
3. Remove two Screws (1).
4. Unhook Spring (8) from left Side Frame (9).
5. Remove Carrier Drive Rack (6) from Tab (7-A) on Right Frame, and lift out Carrier Return Bracket (3) and Carrier Motor (2). Remove Carrier Motor from Bracket.
6. Remove Slider (5) and Spring (4) from Carrier Return Bracket (3).

Replacement: Reverse Procedure.

Adjustments Broken: Line Indicator Position (Adjustment #7).



20. Carrier Molding Removal

1. Remove Frame Assembly, Rack Drive, Platen, and Paper Table (see Removals Index).

2. Spread Frames to disengage Rear Rail (7) from Frames.

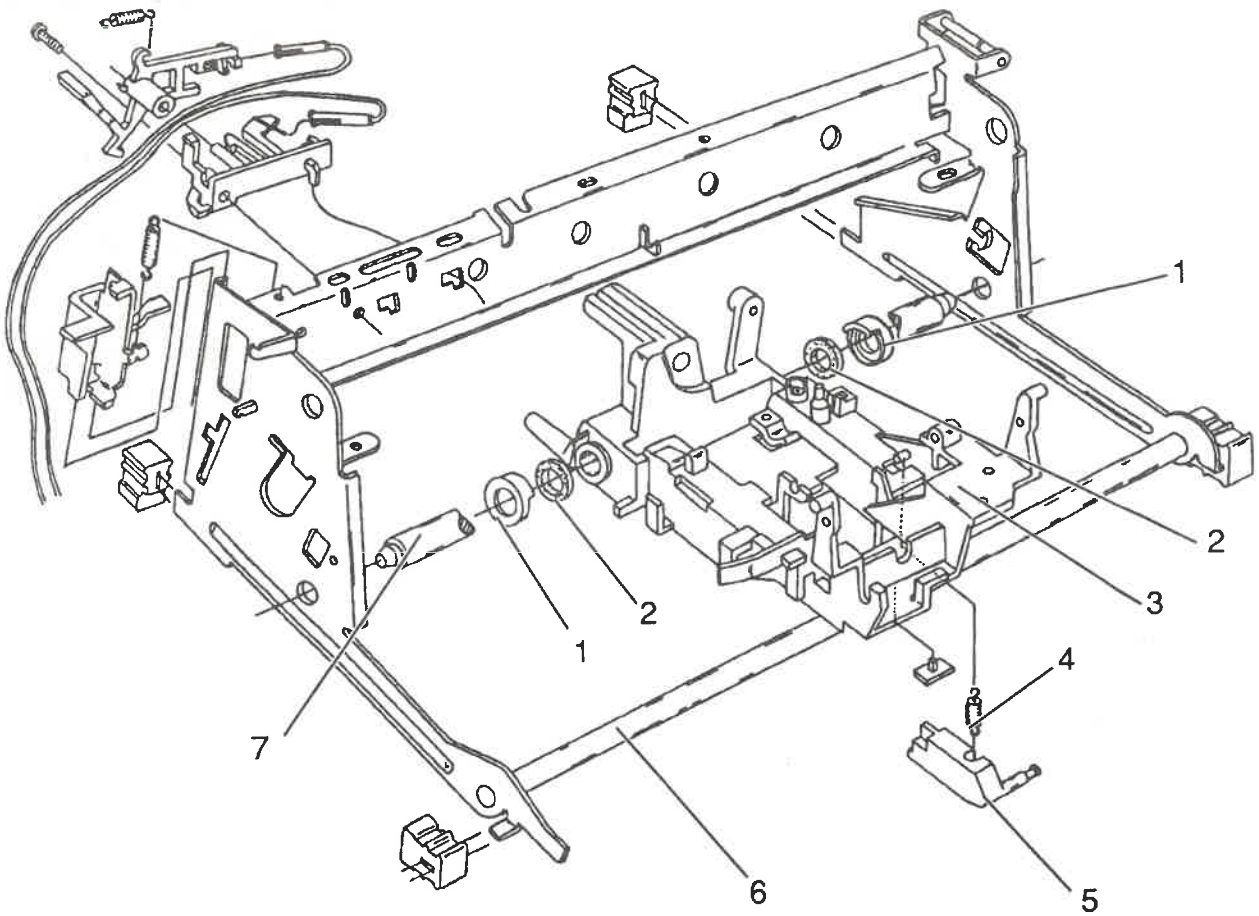
3. Disengage Carrier Molding (3) from Front Rail (6), and slide Rear Rail (7) out of Carrier Molding.

4. Snap off two Felt Retainers (1), and remove two Felts (2).

5. Unhook Restraint Spring (4) from Carrier Molding (3) and remove Carrier Restraint (5).

Replacement: To replace Carrier Molding, remove all components from Molding (see Removals Index). Reverse procedures.

Adjustments Broken: 1, 3, & 7.

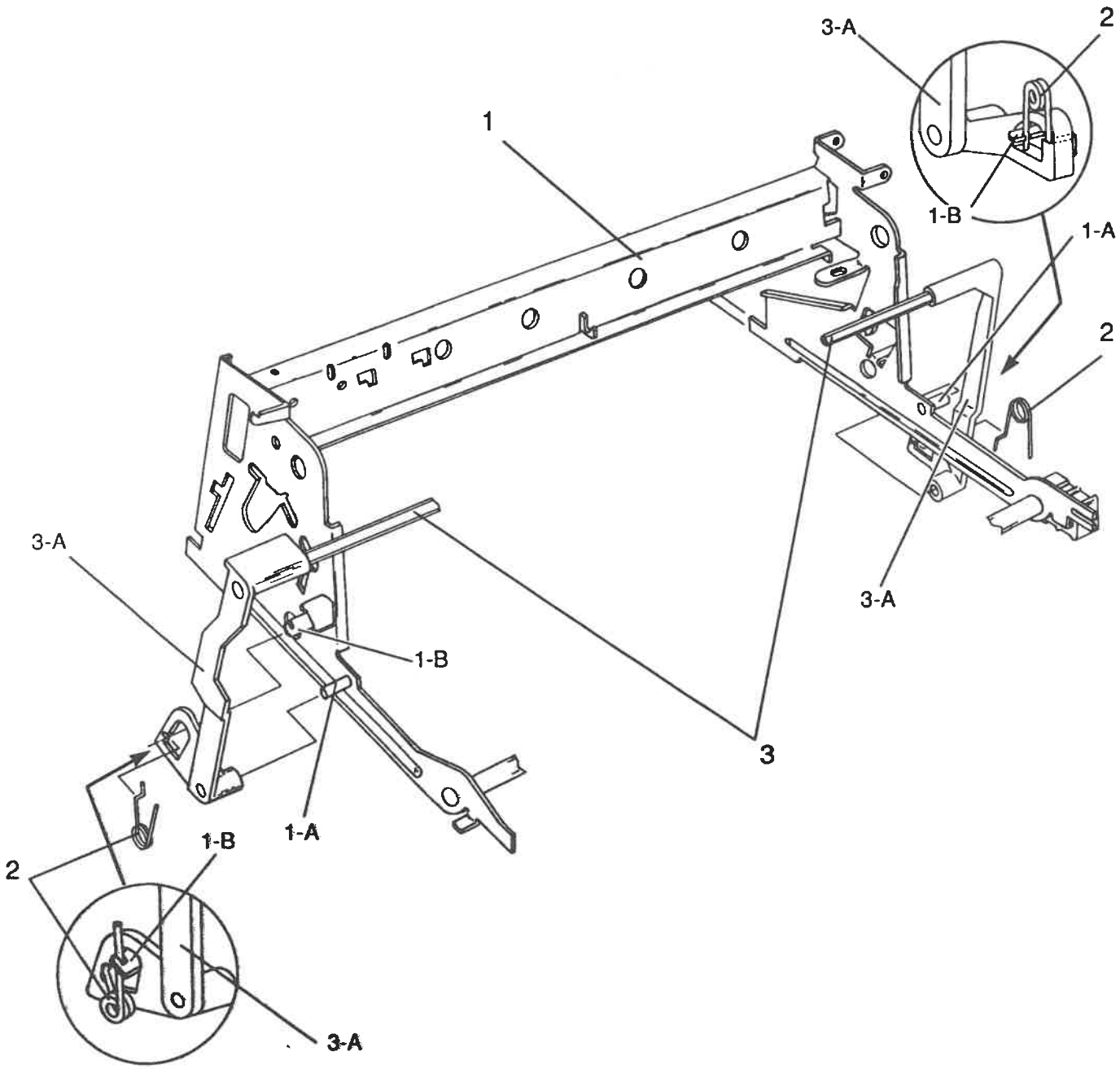


21. Forward Pivoting Paper Bail Removal

1. Remove Left and Right Paper Bail Springs (2).

2. Spread Paper Bail Arms (3-A) and remove Paper Bail (3) from Frame Studs (1-A).

Replacement: Reverse Procedure. Note: Make sure Springs (2) are seated in notches of Bail Arm (3-A) and Side Frame Arm (1-B) as illustrated. If the Springs are not seated properly, they will hold the Paper Bail forward away from the Platen.



SECTION 5

ADJUSTMENTS

Adjustment Sequence Branch Display	Adjustment	Page Number
1 ↓ 2	1. Element Motor Position	5-2
	2. Hammer Center Position	5-3
3 ↓ 4	3. Hammer Assembly Position	5-4
	4. Ribbon Guide Position	5-4
5	5. Cassette Ribbon Position	5-5
6	6. Correction Ribbon Lift	5-5
7	7. Line Indicator Position	5-6
8	8. Line Indicator Clearance from Platen	5-6

General Adjustment Procedure

Mask removal is required for access to most checks and adjustments. Additional access requirements are noted when applicable. All adjustments should be checked with Power Cord unplugged unless otherwise specified.

Circled reference numbers (i.e. (5)) in the illustrations indicate adjustment points.

Sequence of Adjustments: Adjustments in this section are consecutively numbered and should be performed in sequence. The **Branch Display** above shows the relationships among adjustments. The arrow (→) means "*affects.*"

Example:

1
↓
2

Read this display as follows: 1 affects 2; 2 affects no other adjustment; 2 depends on 1 being correct.

Energizing Element Motor for Adjustments

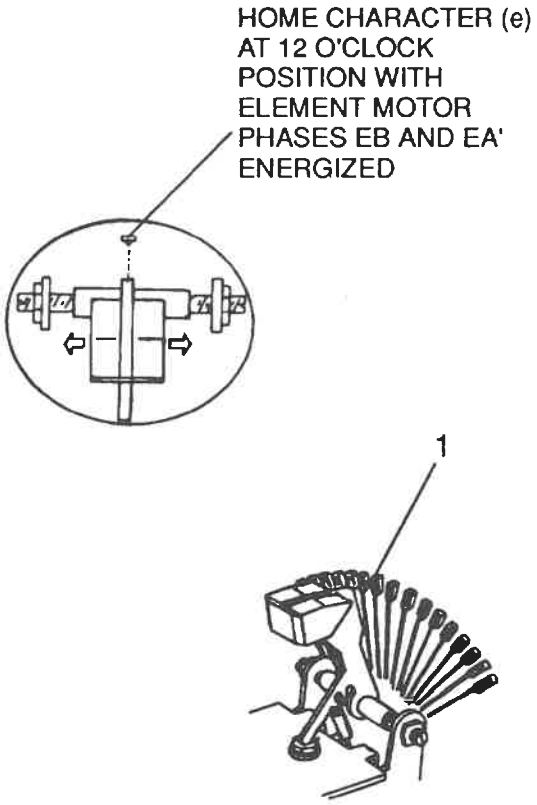
Two adjustments require energizing the Element Motor. Select **Daisy Alignment** from the Diagnostics Menu (refer to Section 6). The Element Motor stays energized for one minute. After one minute, the machine returns to the typing or word processing mode. This procedure may be repeated as often as necessary to make the adjustment.

1. Element Motor Position

Requirement:

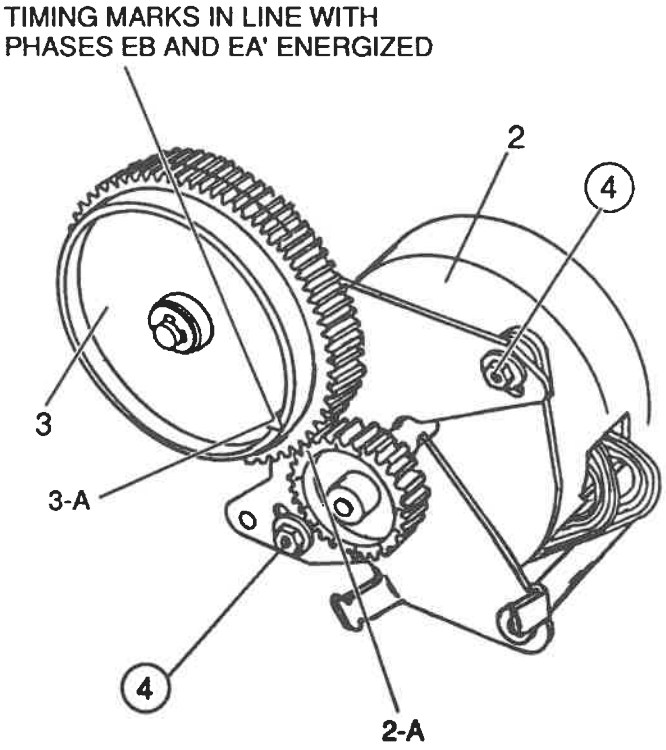
With Phases EB and EA' energized, Element Motor should hold the Home Character (e) Element Petal (1) at 12 o'clock position.

To Check: Select **Daisy Alignment** from the Diagnostics Menu (refer to Section 6), to energize the Element Motor for one minute. Home Character Element Petal should be at 12 o'clock position, and parallel with Hammer. Turn power off and repeat this procedure if more time is required.



Adjustment:

1. With power off, loosen two Screws (4).
2. Energize Element Motor Phases EB and EA' (refer to "To Check" above).
3. Rotate Element Motor (2) so that Home Character (e) Element Petal is at 12 o'clock position. Motor Timing Mark (2-A) may align with Timing Mark (3-A).
4. Hold Motor in position and tighten upper Screw (4). Then tighten lower Screw (4). Check position of Element Petal and fine adjust if necessary. Turn power off.



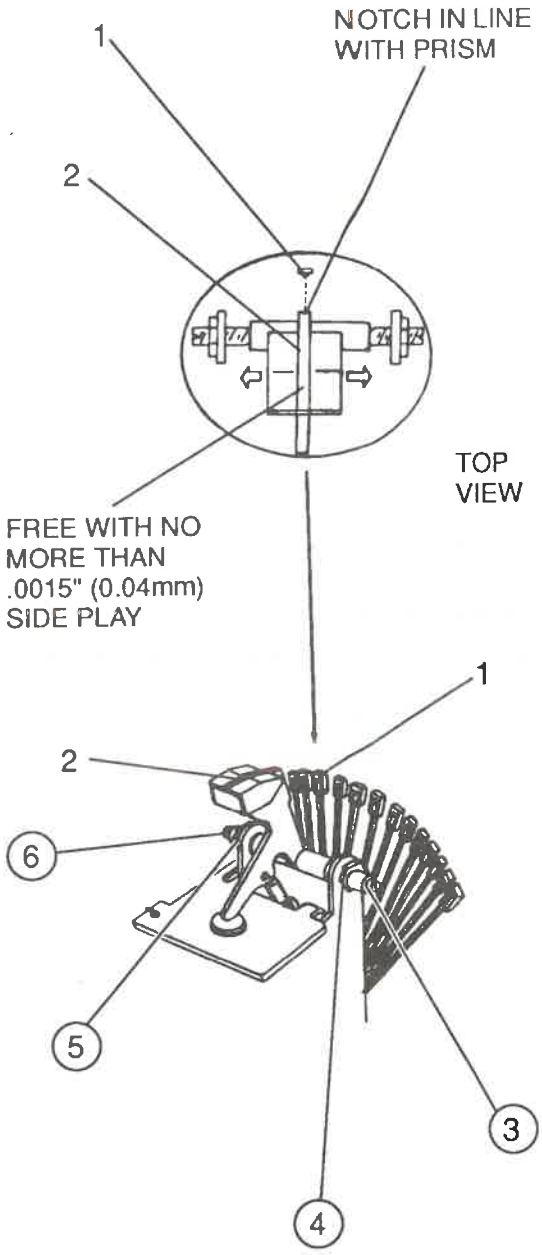
2. Hammer Center Position

Requirement:

A) With Element Motor Phases EB & EA' energized, notch of Hammer (2) should align with Prism of Element Petal (1).

To Check: Energize Element Motor Phases EB and EA' (refer to Adjustment #1 "To Check"). Manually press Hammer (2) against Element Petal (1). Petal should not move left or right when Notch of Hammer engages Prism of Petal.

B) Hammer (2) should be free on its pivots with no more than .0015" side play.



Adjustment:

1. Energize Element Motor Phases EB and EA' (refer to Adjustment #1 "To Check").

2. Remove Ribbon Guide from Hammer Pivot Nuts.

3. Loosen Nuts (4) & (5) and regulate Right Pivot Screw (3) to meet Requirement A; tighten Right Nut (4).

4. Hold Hammer against Right Pivot Screw (3), and regulate Left Pivot Screw (6) to meet Requirement B; tighten Left Nut (5).

5. Replace Ribbon Guide onto Hammer Pivot Nuts.

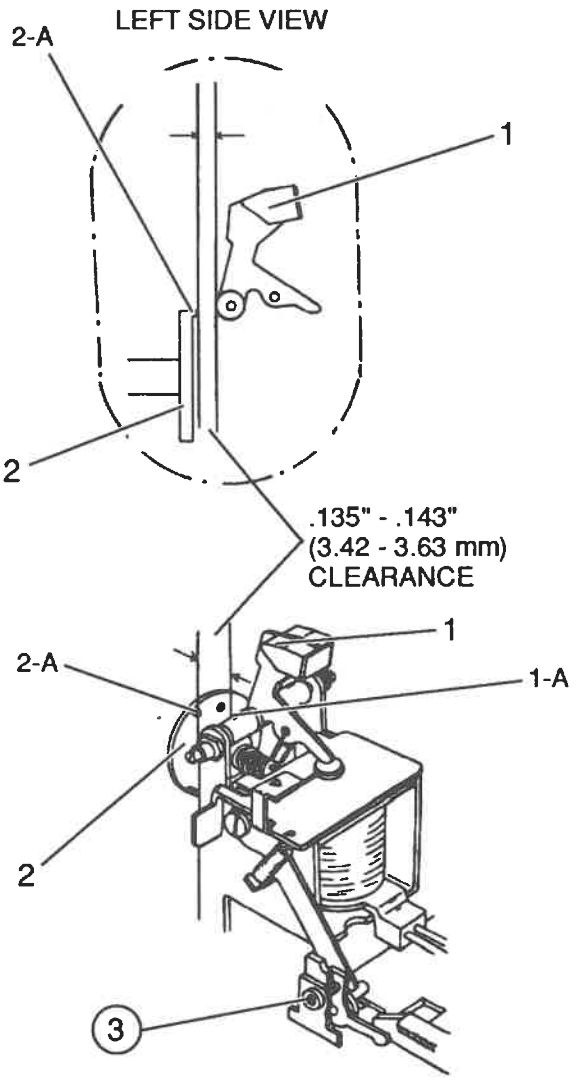
3. Hammer Assembly Position

Requirement:

With Hammer Assembly (1) latched in print position, there should be .135"-.143" clearance between Rear of Hammer Shaft (1-A) and Element Driver Pads (2-A). Check with Print Element and Ribbon Guide removed.

Adjustment:

1. Loosen Retractor Bracket Screw (3).
2. Rotate Element Driver (2) so that one pad is opposite Hammer Shaft.
3. With Hammer Assembly (1) latched in print position, insert a .139" Shim between Hammer Shaft (1-A) and Driver Pad (2-A).
4. Hold Hammer Assembly (1) against Shim, and tighten Screw (3).
5. Replace Ribbon Guide and Print Element.



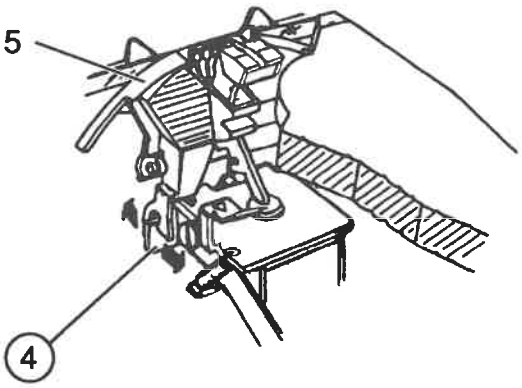
4. Ribbon Guide Position

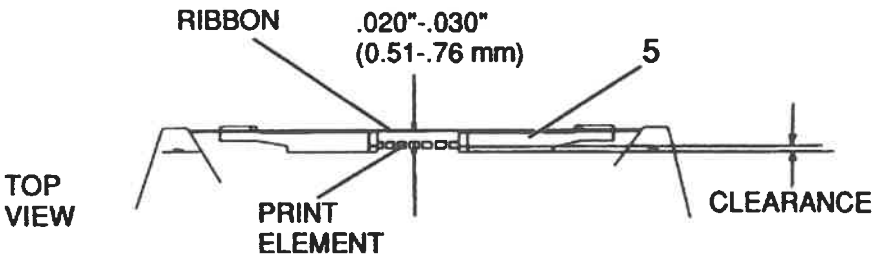
Requirement:

With a Ribbon Cassette in place, there should be .020"-.030" clearance between the Ribbon and the typeface of the Print Element. Note: This should provide clearance between the Print Element and the inside surface of the Ribbon Guide (5).

Adjustment:

Form Hammer Solenoid Ear (4) forward or rearward to position Ribbon Guide (5).

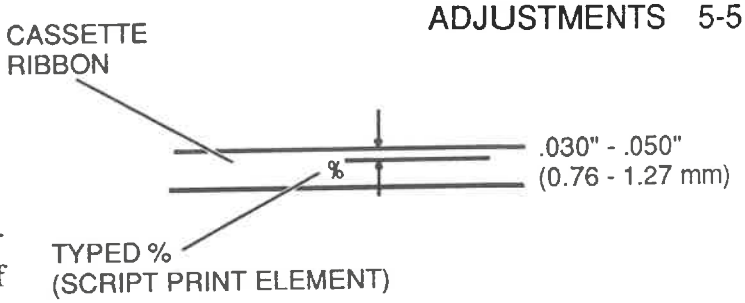




5. Cassette Ribbon Position

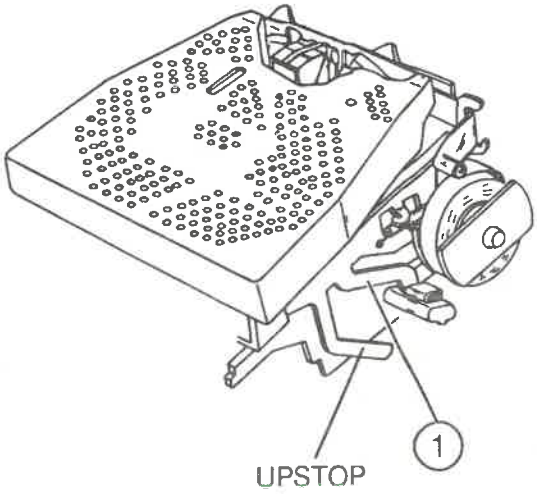
Requirement:

When typed with a Script Print Element, the top of the "%" character should be .030"-.050" from the top of the Cassette Ribbon.



Adjustment:

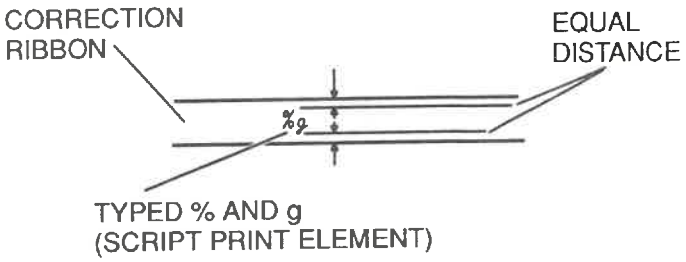
Form Downstop Arm (1) on Correction Lift Bail up or down.



6. Correction Ribbon Lift

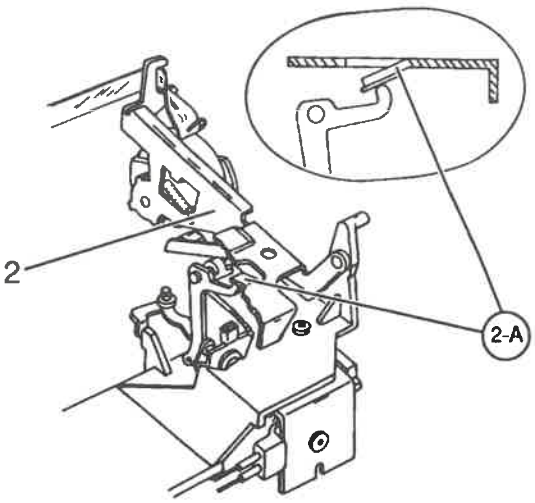
Requirement:

When correcting with a Script Print Element, the distance between the top of the "%" character and the top of the correction ribbon should equal the distance between the bottom of a lower case "g" and the bottom of the correction ribbon.



Adjustment:

Form Arm (2-A) on Correction Lift Bail (2). Note: Be sure Correction Lift Bail Upstop **does not** restrict motion of Bail.



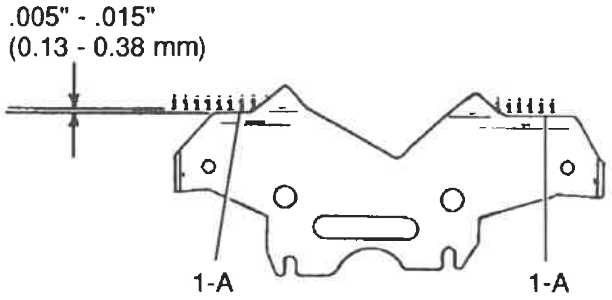
7. Line Indicator Position

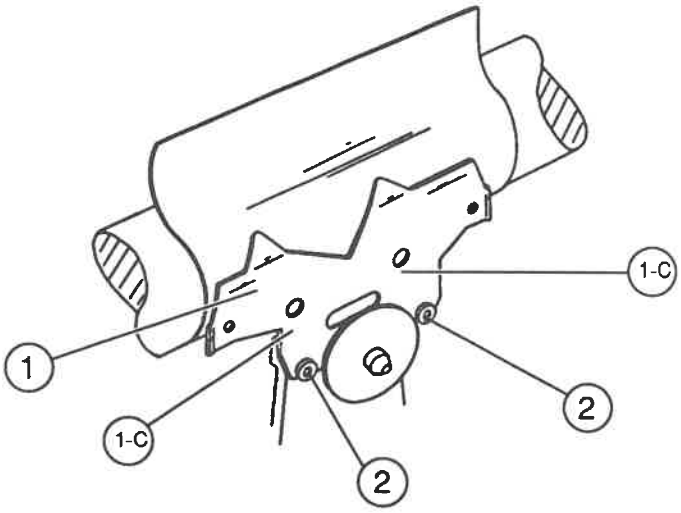
Requirement:

Line Indicator Surfaces (1-A) should rest .005"-.015" below a row of printed "i's," and should be parallel with the typed characters.

Adjustments:

Position Line Indicator (1) with attaching Screws (2).





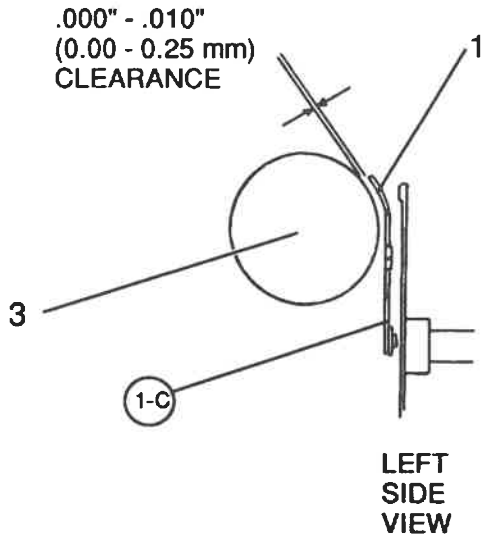
8. Line Indicator Clearance from Platen

Requirement:

There should be .000"-.010" clearance between Line Indicator (1) and Platen (3).

Adjustment:

Form Left and Right Line Indicator Surfaces (1-C) forward or rearward.



SECTION 6

TROUBLESHOOTING

INDEX

Subject	Page Number
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DC Voltage Checks	6-11
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Keyboard Troubleshooting	6-13
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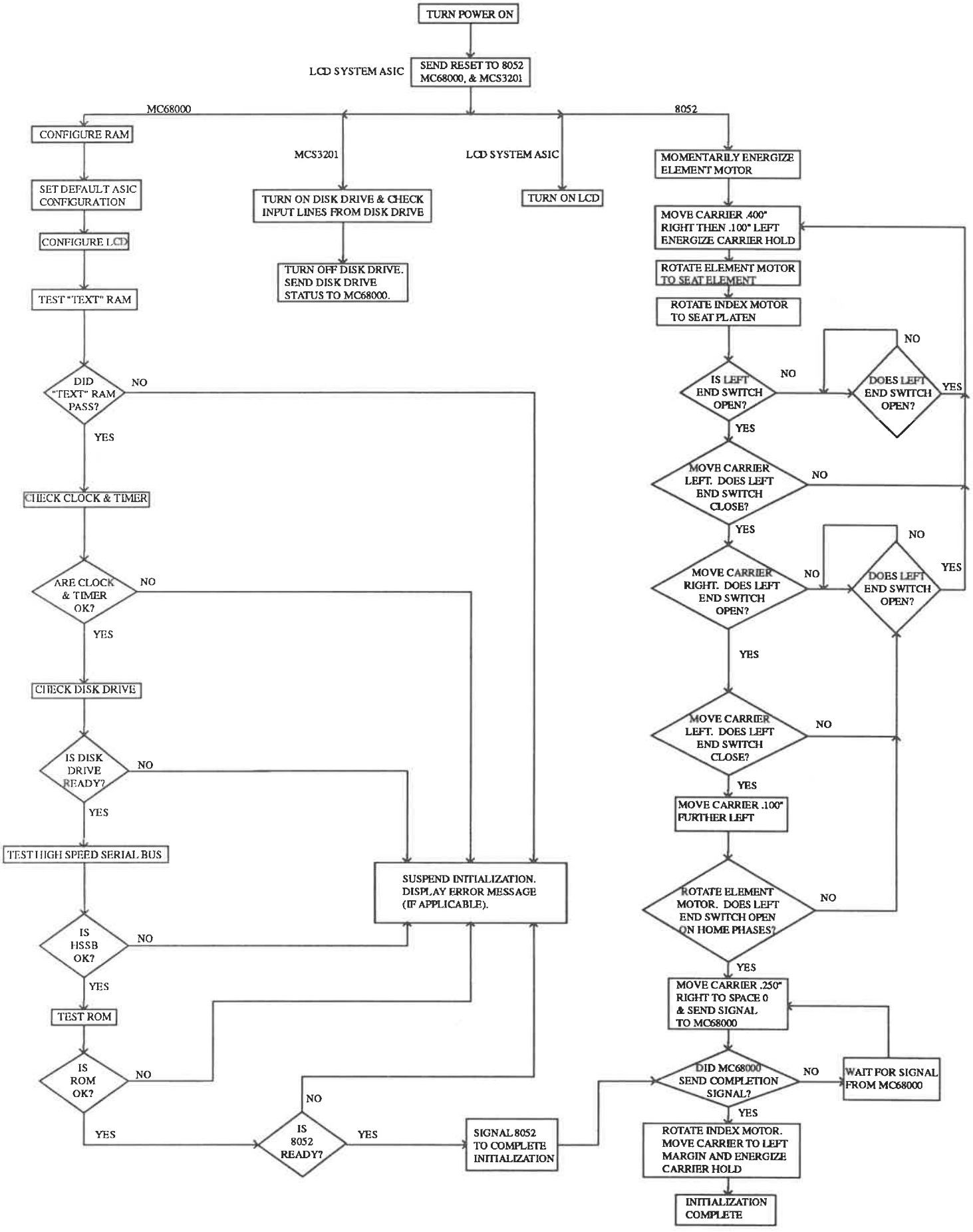
INITIALIZATION FLOW CHART



INITIALIZATION SEQUENCE

The sequence of events which occur during initialization is described below. Understanding this process enables the technician to compare what ***does*** happen with what ***should*** happen, which can often lead to quick diagnosis of a problem.

1. When the Power Switch is turned on, the LCD System ASIC initializes, and it resets the Memory Controller (MC68000), the Motor Controller (8052), and Disk Drive Controller (MCS3201). Also, the Watchdog Circuit begins to monitor the Motors and Solenoids.

2. At this point the initialization process is divided between the 8052, the MC68000, LCD System ASCI, and MCS3201.

3. The **LCD System ASIC** turns on the LCD.

4. The **Motor Controller 8052** performs the following sequences:
   - A) The Ribbon Solenoid momentarily energizes to insure the Ribbon Mechanism is reset.
   - B) The Carrier moves .400" to the right to assure that the Left End Switch Positioner is not holding the Left End Switch closed, and then moves .100" to the left.
   - C) The Electronics applies holding current to the Carrier Motor phases to stabilize the Carrier Motor Shaft.
   - D) The Element Motor Shaft rotates quickly to snap the Element onto the Drive Disc (a maximum of $2^1/_2$ revolutions).
   - E) The Index Motor Shaft rotates for $^1/_2$ forward linespace and then $^1/_2$ reverse linespace to make sure the Drive Gears, Pinion, and Platen Gear are seated properly.
   - F) The Electronics checks if the Left End Switch is open. If the Switch is closed, the Electronics holds the Carrier stable until the Switch opens, and then begins initialization again.
   - G) The Carrier moves left for a maximum of four seconds to check the closing of the Left End Switch. If the Left End Switch never closes, the Initialization Sequence repeats itself every four seconds until the switch is closed or power is turned off.
   - H) The Carrier moves .100" to 1.00" to the right and the Electronics checks if the Switch opens. If the Switch is closed, the Electronics holds the Carrier stable until the Switch opens, and then begins initialization again.
   - I) The Carrier moves to the left until the Left End Switch closes, and then another .100" to the left.
   - J) The Electronics energizes the Element Motor counterclockwise for up to 2.7 revolutions. When the ear on the Left End Switch Positioner drops into the notch on the Rear Scissors Gear under Spring Tension, the Left End Switch opens. The Electronics stops shaft rotation and checks that the Left End Switch opened on the Element home phases. If the Left End Switch does not open, the Electronics holds the Carrier stable until the switch opens. If the Switch does not open when the proper Element Motor phases are turned on, the initialization sequence repeats until this does occur, or until power is turned off.

4. The **Motor Controller** (continued)
   K) Carrier moves approximately .250" to the right. This new location is reference position Zero and signals the MC68000 that it has completed initialization to this point.
   L) The 8052 waits for the MC68000 to send a signal that all other initialization is complete, rotates the Index Motor $^1/_2$ forward and $^1/_2$ reverse linespace, and moves the Carrier to the Left Margin and energizes the Carrier Motor hold.
   M) Initialization is now complete and the 8052 now transfers operational control to the MC68000 and begins functional scanning of the Keyboard, Keypad, Left End Switch, and Mode Selector Switch.

5. The **Disk Drive Controller MCS3201** turns on the Disk Drive and checks that the drive is functioning properly. If it is, the MCS3201 sends a signal to the MC68000 that the Disk Drive is okay.

6. The **Memory Controller MC68000** performs the following sequences while the 8052 LCD System ASIC, and MCS3201 are performing their sequences:
   A) The MC68000 sets up communications between it and the 8052; sets the variables in the System RAM, and clears the LCD RAM to insure no erroneous data is present.
   B) The MC68000 writes Test Text data to the "TEXT" RAM and then reads this data. If the Text data is correct, the next step occurs. If not, the machine stops at this point.
   C) The MC68000 checks the Clock and Timer. If these are okay, it proceeds to the next step. If not, the machine stops at this point.
   D) The MC68000 checks to see if the MCS3201 has completed Disk Drive initialization. If so, it proceeds to the next step. If not, the machine stops at this point and "TEST DISK" appears on the LCD.
   E) The MC68000 checks the High Speed Serial Bus (HSSB) and proceeds to the next step if it is okay. "HSSB FAILURE" displays in the LCD and the machine stops if the test fails.
   F) The MC68000 performs a Cyclical Redundency Check (CRC) of the System ROM and proceeds to the next step if this is okay. If not, the machines stops at this point.
   G) The MC68000 checks to see if the 8052 has moved the Carrier to position Zero (Step 4.K). If it has not, the machine stops. If it has, the MC68000 signals the 8052 to move the Carrier to the preset Left Margin.
   H) MC68000 initialization is now complete.

7. Once 8052, MC68000, LCD System ASIC, and MCS3201 initialization are all complete, the machine initialization is complete.

TROUBLESHOOTING GUIDE FOR ELECTRICAL PROBLEMS

This Troubleshooting Guide provides probable causes for some specific machine problems. There is no intent to cover every possible thing that could go wrong. Since electrical problems may cause a machine failure during initialization, the technician should read and thoroughly understand the preceding section on the Initialization Sequence.

OBSERVE STATIC PRECAUTIONS

Important: When working with static sensitive devices, such as the LCD and Printed Circuit Boards, be sure to observe static precautions to prevent damage to these devices.

GENERAL TROUBLESHOOTING TECHNIQUES

- Look for the obvious (broken wires, unplugged connectors, etc.)
- Check the problem part first, and then logically limit the possibilities through all associated wiring, connectors, and circuit boards.
- Check mechanical functions for freeness, lubrication, and proper operation.
- Check standard adjustments.

Diagram Reference Symbol:

7D-1 Indicates appropriate diagram page number.

Watchdog Circuit

The Watchdog Circuit is a safety circuit in the Power Supply Circuit that checks the voltage and current on the 18 volt line to monitor the Motors and Solenoids. If these components remain energized longer than normal, the Watchdog Circuit shuts down the 18 volt and 5 volt power supplies. Also there is a separate Hammer Watchdog Circuit which shuts down the 18 volt and 5 volt power supplies if the Hammer Solenoid remains energized longer than normal.

To disable the Watchdog Circuit for troubleshooting purposes, short point "A" of Diode CR11 on the Control PC Board to ground. To disable the Hammer Watchdog Circuit, short point "B" of Diode CR19 on the Control PC Board to ground. If not disabled, the Watchdog Circuits disable the Power Supply. *7E-1*

Control PC Board Connections

When troubleshooting the PWP, it is not necessary to have the LCD connected to the Control PC Board. Also, if the PWP initializes correctly without the LCD, but not when it is connected, a problem exists in the LCD. Likewise, Keyboard and Mode Switch do not have to be connected to the PC Board. When the Mode Switch is disconnected, the PWP defaults to the typewriter mode.

SYMPTOM: Machine Totally Dead

(i.e. LCD is blank, and Carrier does not move at all)

Probable Causes:
1) Transformer
2) 3 Amp Pico Fuse (F1)
3) Control PC Board

How to Check Power Circuit

A) Disconnect Power Cord from AC outlet. Disconnect Transformer Connector P2 from Control PC Board. Plug Power Cord into AC outlet.

Use a Voltmeter to measure the AC voltage across the two pins of Transformer Connector P2. The reading should be 25-35 Volts AC. If not, replace Transformer.

B) If the reading is good, disconnect Power Cord, and reconnect Transformer Connector P2 to the Control PC Board. Plug in Power Cord, and measure the AC Voltage across Connector P2. The reading should be approximately 24 Volts AC. if not, there's a short on the Control PC Board.

C) If the reading is good, turn power off and check for continuity across Pico Fuse F1. The reading should be 0 ohms. If not, replace the Pico Fuse.

D) If the reading is good, check the On-Off Switch Connector from the Mask. If the switch checks okay, the electronics on the Control PC Board are faulty. Trouble-shoot and replace the Board.

SYMPTOM: Machine Fails to Complete Initialization or Repeats Initialization

When checking initialization, move Carrier to the center of the machine, and turn Power On. Use the following guide to determine the cause of the failure. Refer to the Wiring Diagram. *7D-1*

Symptom	Probable Cause(s)
Element Motor rotates, Carrier does not move. Platen wiggles approximately every 3 seconds. Contrast Control operates normally.	1) Carrier Motor Connector disconnected. 2) Control PC Board--Carrier Motor Circuit bad.
Element Motor doesn't rotate. Machine tries to initialize and repeats this until power is turned off. Contrast Control operates normally.	1) Element Motor Connector disconnected 2) Control PC Board -- Element Motor Circuit bad.
Carrier vibrates against Left Side Frame, then tries to reinitialize approximately every 2 seconds. Contrast Control operates normally.	1) Left End Switch or switch connection is always open. 2) Control PC Board -- Left End Switch Circuit bad.
Carrier moves right about .4"; Element rotates; Carrier moves right again about .8" and stays there. Contrast Control works.	1) Left End Switch is always closed. 2) Control PC Board -- Left End Switch Circuit bad.
Platen wiggles; Carrier moves right approximately .4"; Element rotates; Carrier chatters, pauses, and moves noisly to the left frame and stops. Contrast Control works.	1) Carrier Motor Phase is open. 2) Control PC Board -- Carrier Phase Circuit bad.
Element Motor noisy and sluggish during initialization. Carrier may try to continually reinitialize. Strobing occurs during printing.	1) Element Motor Phase is open. 2) Control PC Board -- Element Phase Circuit is bad.
LCD displays "Testing LCD System, Disk Test," and Carrier stops at Space 0.	1) Disk Drive Power Cable disconnected. 2) Disk Drive Cable disconnected. 3) Disk Drive. 4) Control PC Board -- Disk Drive Circuit is bad.

LCD Problems *7D-1*

Symptom	Probable Cause(s)
LCD is dark blue and no contrast control.	1) Defective LCD. 2) Defective LCD Cable. 3) Defective Control PC Cable.
Image on right half of LCD is clear. No image on left half.	1) DS1 Line on LCD Cable open. 2) Defective LCD or Control PC Board.
Image on left half of LCD is clear. Same image also shows on right half, but is distorted.	1) DS2 Line on LCD Cable open. 2) Defective LCD or Control PC Board.
LCD is blank; and no contrast control.	1) FLM Line on LCD Cable open. 2) -13 VDC Line on LCD Cable is open. 3) Defective LCD or Control PC Board.
Slight loss of contrast on LCD.	1) MB Line on LCD Cable open. 2) Defective LCD or Control PC Board.
LCD is unlit, no contrast.	1) CL1 Line on LCD Cable open. 2) Defective LCD or Control PC Board.
LCD is unlit with dark vertical lines. Contrast Control works.	1) CL2 Line on LCD Cable open. 2) Defective LCD or Control PC Board.
LCD flickers, various block patterns, and poor contrast control.	1) +5 VDC Line on LCD Cable open. 2) Defective LCD or Control PC Board.
Very narrow range or no contrast control.	1) Defective Contrast Control. 2) Defective LCD. 3) VR8 on Control PC Board.

Miscellaneous Problems *7D-1*

Symptom	Probable Cause(s)
Machine completes initialization; Typewriter Mode is normal, but Word Processing Mode **cannot** be selected.	1) Mode Selector Switch. 2) Defective Control PC Board.
Prints wrong characters or strobes (Hammer strikes between Print Element Petals).	1) Defective Print Element. 2) Incorrect Element Motor Position (Adjustment #1). 3) Incorrect Hammer Center Position (Adj. #2). 4) Broken Disc on Element Drive Shaft or binding Element Drive Shaft. 5) Linefinder or Ribbon Guide interferes with Print Element. 6) Improper Element Scissors Gear tension. 7) Inside Scissors Gear slips on Element Drive Shaft. 8) Defective Element Motor. 9) Defective Control PC Board.
Index Motor vibrates noisily and fails to linespace.	1) Open or shorted windings in Index Motor. 2) Defective Control PC Board.
Hammer or Ribbon Drive Solenoid fails to fire.	1) Defective Solenoid. 2) Defective Control PC Board. 3) 50 Hz machines only: Pico Fuse F2 in Ribbon Solenoid Circuit blown.
Beeper fails to beep.	1) Defective Beeper. 2) Defective Control PC Board.
Left Margin changes.	1) Felt Wipers on Carrier Rear Rail require lubrication. 2) Mechanical interference with Carrier movement. 3) Defective Control PC Board.
Poor vertical correction registration.	1) Linefinder binding on Platen. 2) Paper Feed Rollers binding. 3) Platen binding.
Correction Ribbon too slack (blouses).	1) Defective Brake Spring. 2) Defective Helper Spring on Brake Spring.
Correction Ribbon lifts during normal printing.	1) +36 VDC on +18 VDC line (Check Q13 on Control PC Board).

RESISTANCE AND VOLTAGE CHECKS

Use the following Resistance and Voltage Check Charts when troubleshooting problems with electrical components. With Volt/Ohmmeter probes on specified pins of the Connector, the resistance or voltage readings should read approximately at the values given in the charts. Note: Readings may vary between Volt/Ohmmeters. Refer to the Wiring Diagrams in the appropriate Diagrams Section and Pin locations.

Resistance Checks

All Resistance Checks must be made with the power off and the appropriate Connector unplugged from the Control PC Board. Refer to page 7D-1 to identify Connectors.

* When checking resistance of Motors, both common Connectors on each motor should be measured before assuming a phase is open. The correct resistance readings should occur on one or the other common, not both.

Component	*Connector*	*Pin Numbers*	*Approximate Resistance*
*Element Motor	P-ELE		
COM and A		3 or 4 & 1	64 Ω ± 7%
COM and A'		3 or 4 & 2	64 Ω ± 7%
A and A'		1 & 2	128 Ω ± 7%
COM and B'		3 or 4 & 5	64 Ω ± 7%
COM and B		3 or 4 & 6	64 Ω ± 7%
B' and B		5 & 6	128 Ω ± 7%
*Carrier Motor	P-CAR		
COM and A		3 or 4 & 1	50 Ω ± 7%
COM and A'		3 or 4 & 2	50 Ω ± 7%
A and A'		1 & 2	100 Ω ± 7%
COM and B'		3 or 4 & 5	50 Ω ± 7%
COM and B		3 or 4 & 6	50 Ω ± 7%
B' and B		5 & 6	100 Ω ± 7%
*Index Motor	P-IND		
COM and A		3 or 4 & 1	50 Ω ± 7% or 55 Ω ± 7%
COM and A'		3 or 4 & 2	50 Ω ± 7% or 55 Ω ± 7%
A and A'		1 & 2	100 Ω ± 7% or 110 Ω ± 7%
COM and B'		3 or 4 & 5	50 Ω ± 7% or 55 Ω ± 7%
COM and B		3 or 4 & 6	50 Ω ± 7% or 55 Ω ± 7%
B' and B		5 & 6	100 Ω ± 7% or 55 Ω ± 7%
Left End Switch	P-LES	1 & 2	0 Ohms when closed; Infinite (∞) Ohms when open
Ribbon Solenoid	P-RSOL	1 & 2	9.60 Ω ± 1
Hammer Solenoid	P-HSOL	1 & 2	2.95 Ω ± .29 Ω
Transformer Primary (Switch must be turned on)	AC Plug	Prongs	~ 9 Ω
Transformer Secondary	P2	1 & 2	~ .7 Ω

DC Voltage Checks

All DC Voltage checks must be made with Connectors in place and power on. Set Voltmeter for DC Volts and appropriate voltage range. With power off, touch common probe of Voltmeter to Power Ground Reference Point 7E-1, and touch the other probe to the Check Point listed in the Chart. Turn power on, allow machine to initialize, and take readings (Idle State). Refer to the appropriate Diagrams Section for Connector locations. ***7D-1 7E-1***

Caution: Whenever performing checks with power on, take care not to short two points together with the Voltmeter probes.

Component	*Check Point*	*Pin Location*	*Approximate DC Voltage*
+5 VDC	Control PCB	W11	+4.75 to 5.25 VDC
+18 VDC	Control PCB	W10	+17.1 to 18.9 VDC
-13 VDC	Control PCB	VR8 Anode	-12.4 to -13.6 VDC
Left End/Lid Switch (with Switch open)	P-LES	Pin 1 Pin 2	+4.75 to 5.25 VDC 0.0 VDC
Left End/Lid Switch (with Switch closed)	P-LES	Pin 1 Pin 2	0.0 VDC 0.0 VDC
Ribbon Solenoid	P-RSOL	Pins 1-2	+17.1 to 18.9 VDC
Hammer Solenoid	P-HSOL	Pins 1-2	+17.1 to 18.9 VDC
Element Motor	P-ELE	Pins 1-6	+17.1 to 18.9 VDC
Index Motor	P-IND	Pins 1-6	+17.1 to 18.9 VDC
Carrier Motor (see note 1)	P-CAR	Pins 1-6	+.7 or +4.2 VDC
+5 VDC to LCD	SP1/14	Pin 11	+4.75 to 5.25 VDC
-13 VDC to LCD (see note 2)	SP1/14	Pin 13	-12.5 to -13.5 VDC
+5 VDC to Disk Drive	P-DP	Pin 1	+4.75 to 5.25 VDC
TW/WP Mode Switch (TW Position)	P-MODE P-MODE	Pin 1 Pin 2	0.0 VDC +4.75 to 5.25 VDC
TW/WP Mode Switch (WP Position)	P-MODE P-MODE	Pin 1 Pin 2	0.0 VDC 0.0 VDC

Note 1: Voltage reading depends upon location of the Carrier Rotor during holding current.
Note 2: -13 VDC may be -12 VDC ± 5% or -14 VDC ± 5% depending on the Zener Diode used in Position VR8.

Caution: Whenever performing checks with power on, take care not to short two points together with the Voltmeter probes.

AC Voltage Checks

Make AC Voltage checks with Connectors in place and power on. Set Voltmeter for AC Volts and appropriate voltage range. Touch probes to points listed below. ***7D-1 7E-1***

Check	***Check Points***	***Approximate AC Voltage***
Transformer Input	Check Line Voltage at Power Outlet	120 VAC ± 10% **or** 230 VAC ± 10% **or** 240 VAC ± 10%
Transformer Output	P2, Pins 1 & 2	25 to 35 VAC

KEYBOARD TROUBLESHOOTING PROCEDURE

Note: Refer to the appropriate Diagrams Section for Keyboard Switch Layout and Matrix Charts. *7A-2 7A-3*

1. Identify the Matrix Position Number(s) for the Key(s) from the Keyboard Switch Layout Chart (the character "1" is matrix position S2).

2. Identify the Column and Row for that position from the Keyboard Matrix Chart. Then determine Keyboard Connector Pin Numbers that correspond with the column and row of the suspect key (i.e. position S2 is tied to Column C1 and Row R0, which correspond to Pins 8 & 15 of the Keyboard Connector).

3. Determine whether the problem is with the Keyboard or Control PC Board as follows:

   A) Remove the Keyboard from the machine under test. Power up the machine to initialize it and actuate the Lid Switch.

   To check operation of any individual character, simply short the appropriate pins on the Control PC Board Connector J3 to see if that particular character types. For example, if checking the character "1," touch a Jumper Wire between Pins 8 & 15 of Connector J3. This allows the typewriter to type the character "1" and repeat it until the Jumper Wire is removed. If the character fails to type, the problem is in the Control PC Board and replacement is necessary.

   B) If character does type, then problem is a Keyboard fault.

4. Diagnose a Keyboard fault as follows:

   A) Touch the one lead of an ohmmeter to the pin on the Keyboard Connector that corresponds with the appropriate Column. Then touch the other lead to the pin on the Keyboard Connector that corresponds with the appropriate Row [i.e. for position S2 touch one lead to Connector P3, Pin 8, (Column C1) and the other lead to Connector P3, Pin 15 (Row R0)]. Note: Since there are no Diodes used with this Keyboard, it makes no difference which ohmmeter lead is touched to the Matrix Column and which one is touched to the Matrix Row.

   B) Depress the Key being checked. If the switch is good, the ohmmeter should indicate less than 1000 ohms resistance. (Readings vary with different meters. To know what the meter should read, take a similar reading on a known good Key Switch in the Keyboard circuit). If meter indicates an open, replace the Molded Dome Switches.

   C) If there are a definite 7 or 8 characters or functions that do not operate, check to see if those 7 or 8 characters or functions are in the same Column or Row in the Keyboard Matrix. If they are, check all switches in that Column or Row through the Keyboard Connector. If they are bad, replace the Keyboard Flexible Circuit.

SERVICE DIAGNOSTICS MENU

The PWP has a Service Diagnostics Menu. To access this Menu, depress the **Select, Delete, and Return Keybuttons** when the machine is on. The Service Diagnostics Menu appears and displays the Part Numbers of the Software installed in the machine, plus the Menu Options. At this point in time, the options are Self Test, Daisy Alignment, and Reinitialize. Use the Cursor Keys to position the Cursor at the desired choice, and depress the Return Keybutton to begin the test. Or use the Select Keybutton and the indicated Character to select the test and then depress the Return Key.

-- Self Test

The machine prints a full line of characters, corrects a few characters in the middle of the line, performs a linespace and carriage return. The machine continues this routine until power is turned off. All data in RAM is lost.

-- Daisy Alignment

The Carrier moves to the preset left margin, the Diagnostics Menu disappears and the original screen reappears, and Element motor phases EB and EA' are energized for one minute to make adjustments. When the test is over, the machine returns to the mode and screen which the machine was in prior to selecting the Diagnostics Menu. Data in RAM is not lost. To repeat this test, enter the Service Diagnostics Menu and select Daisy Alignment.

-- Reinitialize

This reinitializes the machine. All data in RAM is lost.

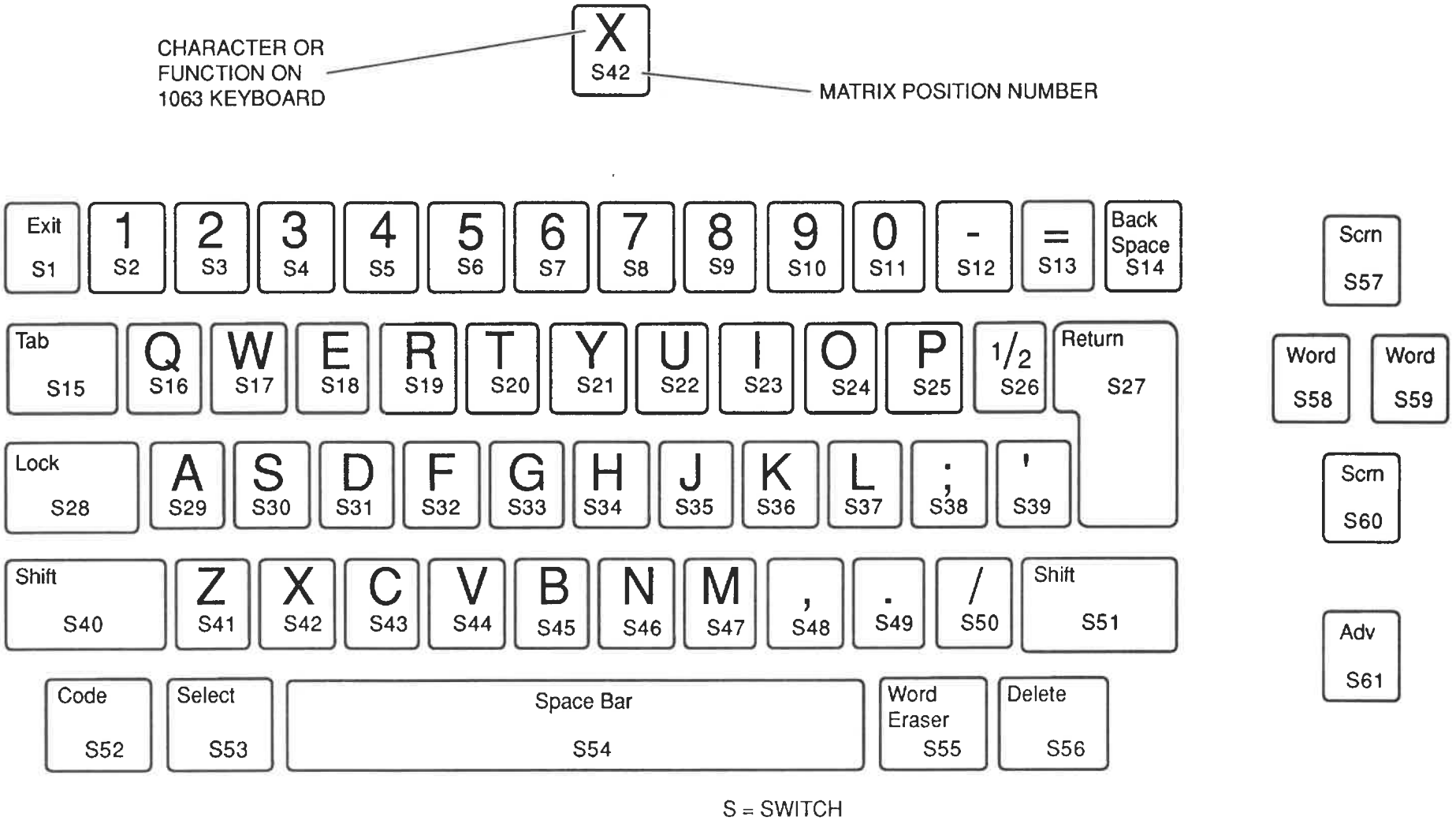
SECTION 7

DIAGRAMS

5NEC PWP 1200	5NEB PWP 2200	5NEA PWP 3200
5NCC PWP 125	5NCB PWP 225	5NCA PWP 325
5NDC PWP 57D	5NDB PWP 67D	5NDA PWP 77D
5NWC Mark 1000		

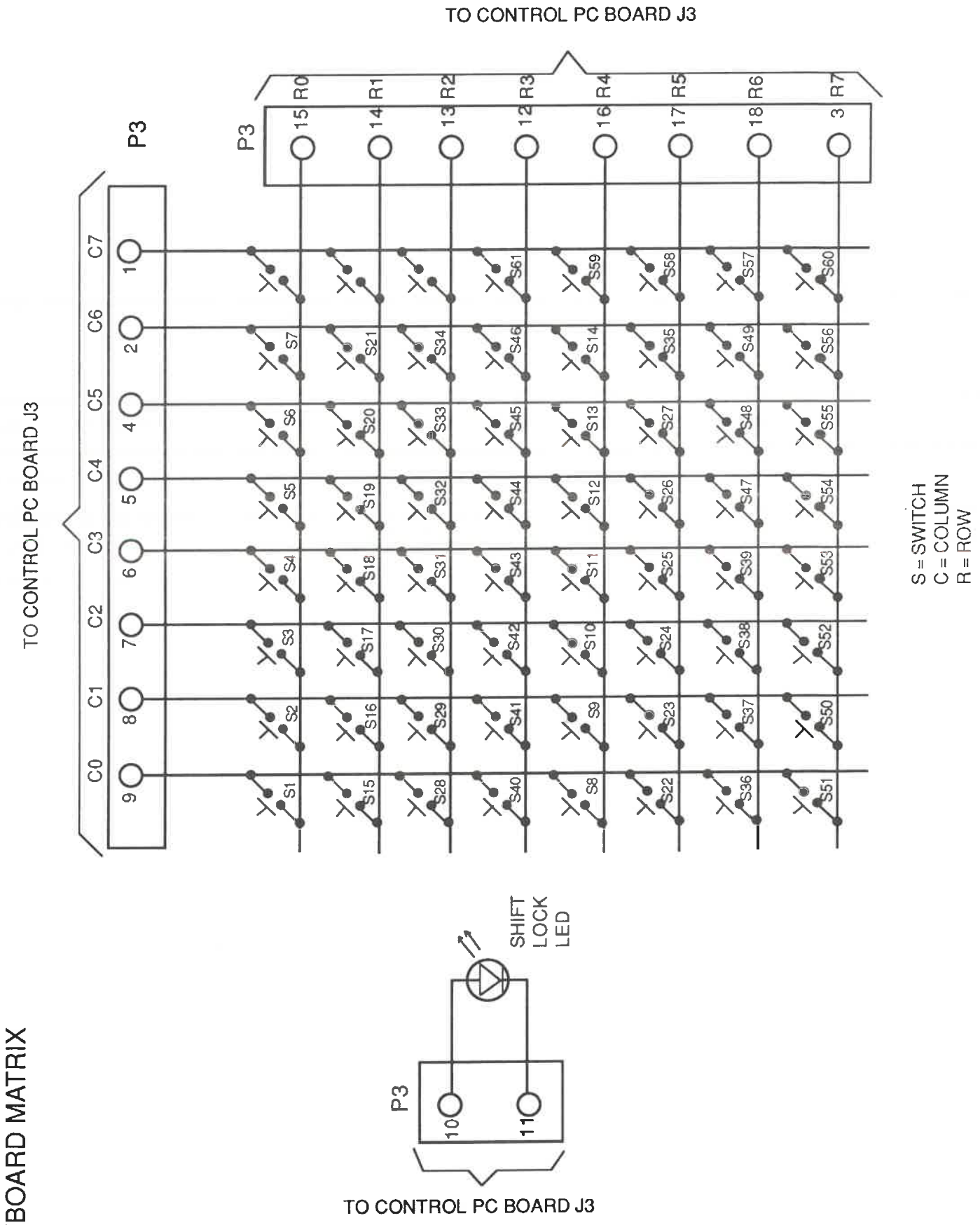
		Page Number
7A	KEYBOARD DIAGRAMS	
	Keyboard Layout Chart	7A-2
	Keyboard Matrix Diagram	7A-3
7B	WIRE ROUTING	
	Left Side	7B-1
	Right Side	7B-2
	Carrier	7B-3
	LCD Housing & Mask	7B-4
7C	WAVE FORMS	7C-1 & 7C-2
7D	WIRING DIAGRAM	7D-1
7E	COMPONENT DIAGRAMS	
	Component Layout	7E-1
	Component Location	7E-2
	Component Location Chart	7E-3
	Jumper Wire/Zener Diode Chart	7E-4

KEYBOARD LAYOUT CHART



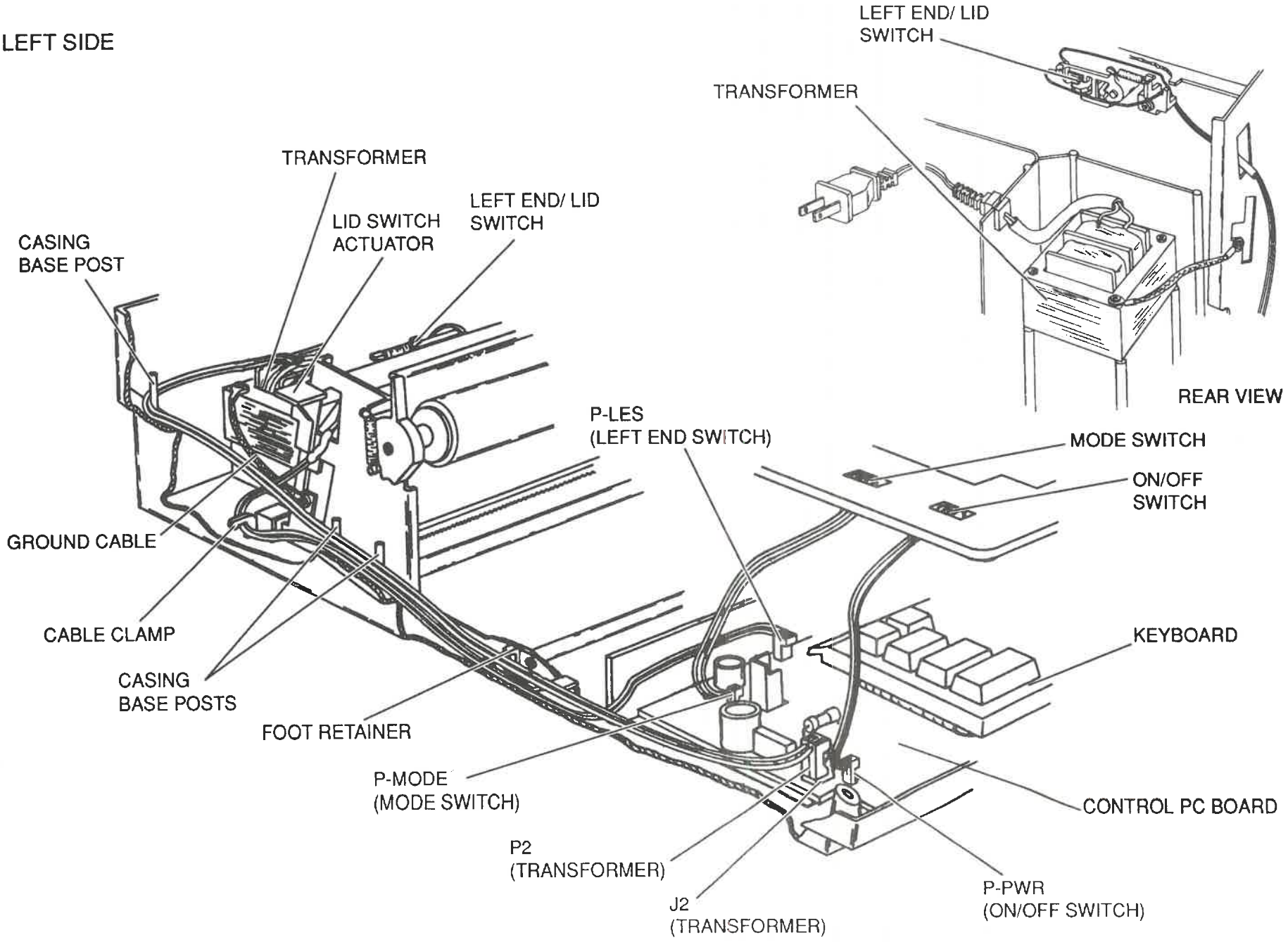
S = SWITCH

KEYBOARD MATRIX



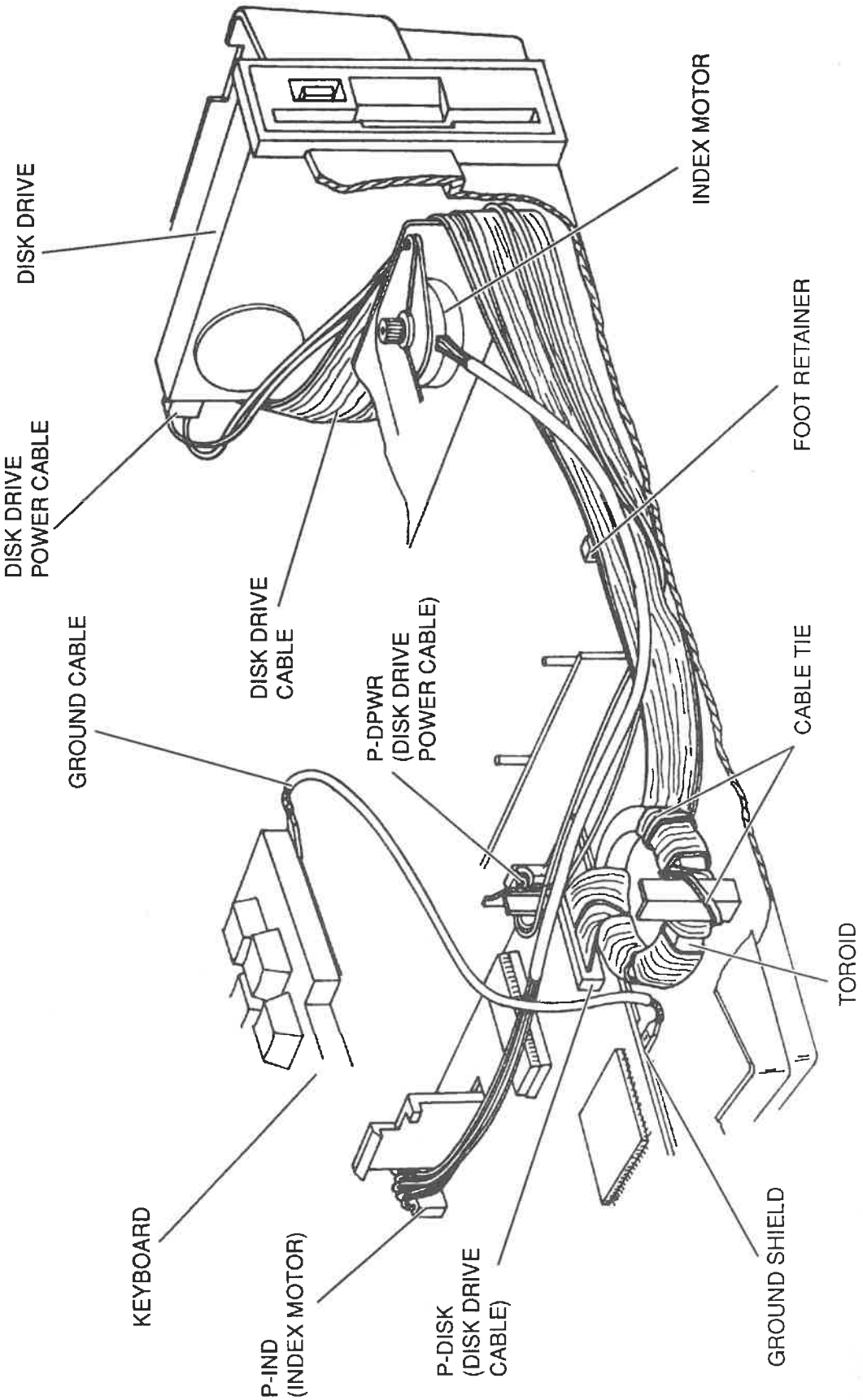
WIRE ROUTING

LEFT SIDE



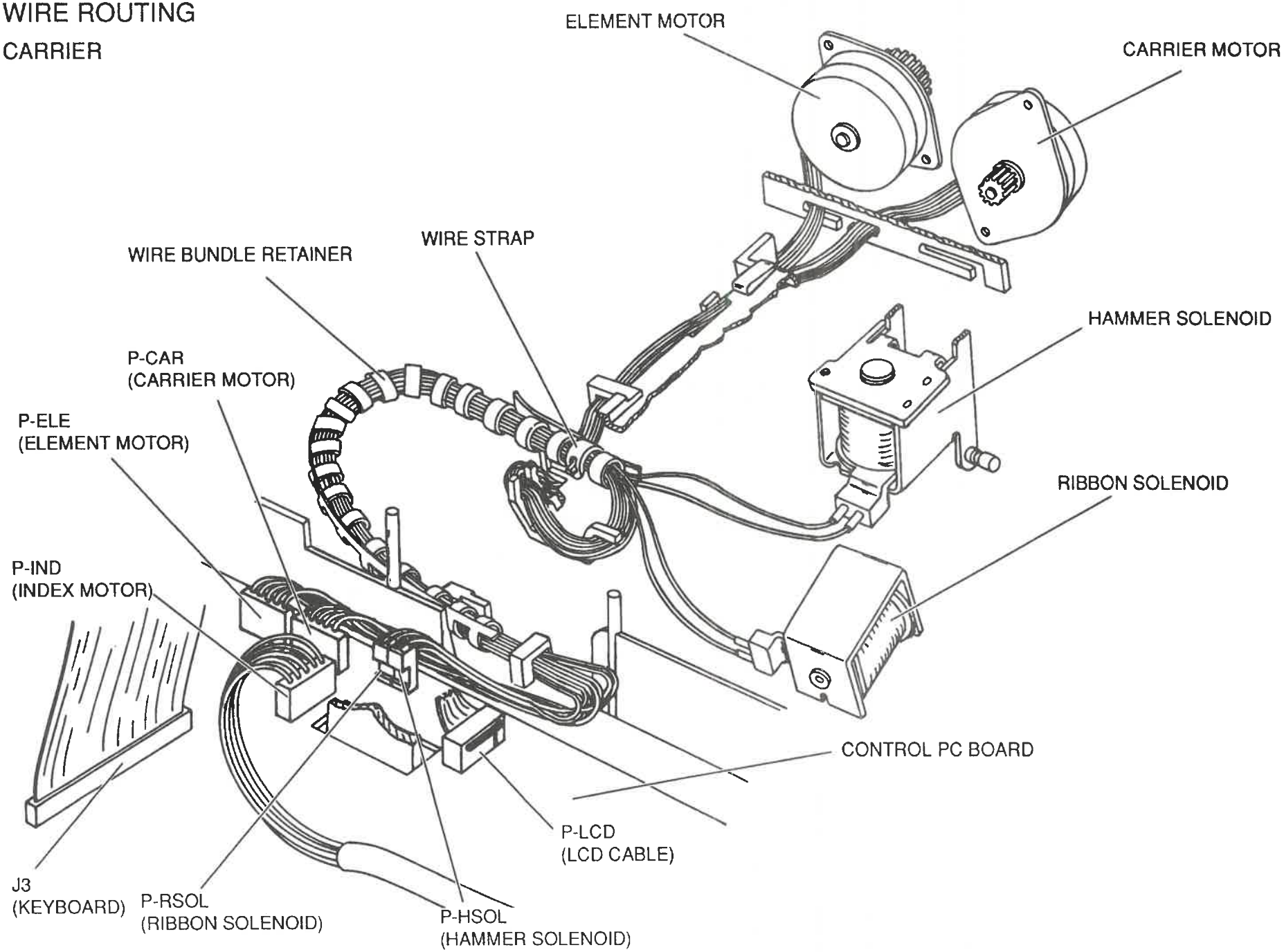
WIRE ROUTING

RIGHT SIDE



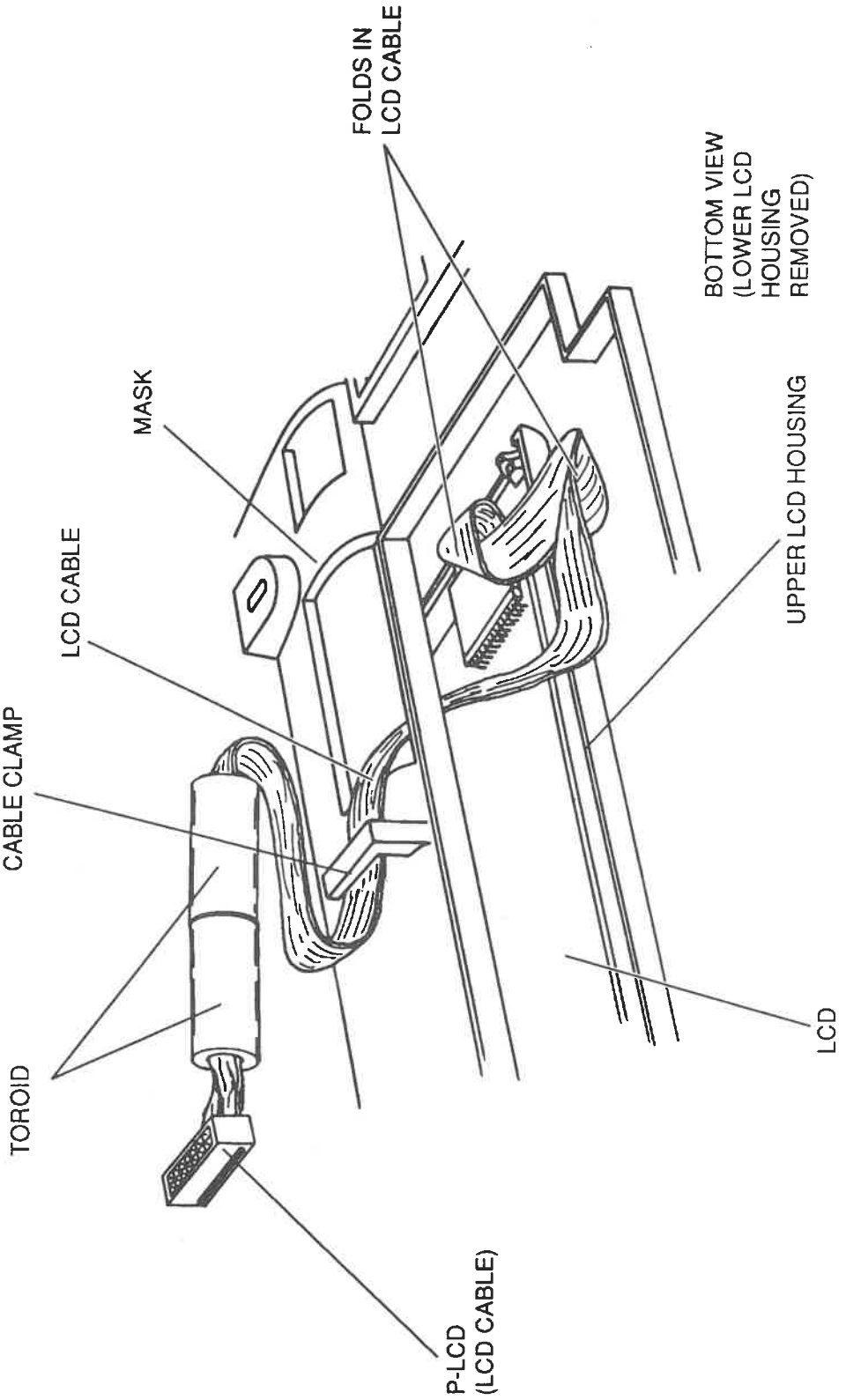
WIRE ROUTING

CARRIER



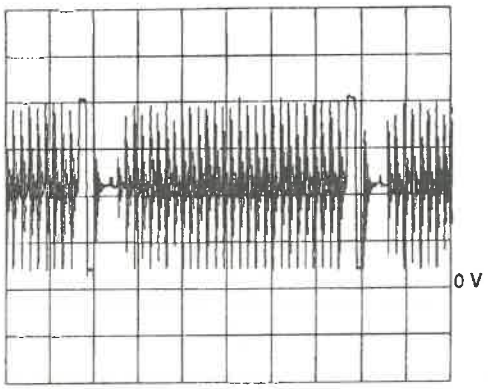
WIRE ROUTING

LCD HOUSING & MASK

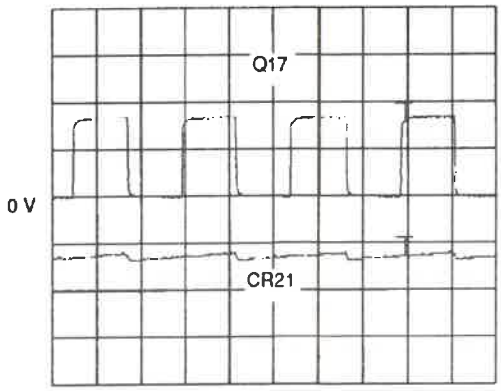


WAVE FORMS

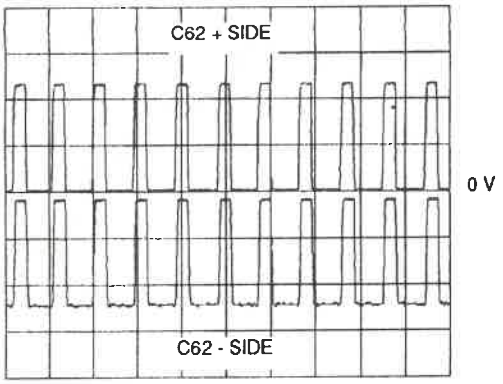
18 VOLT SUPPLY
Q13 DRAIN
10 V/div .1 msec/div



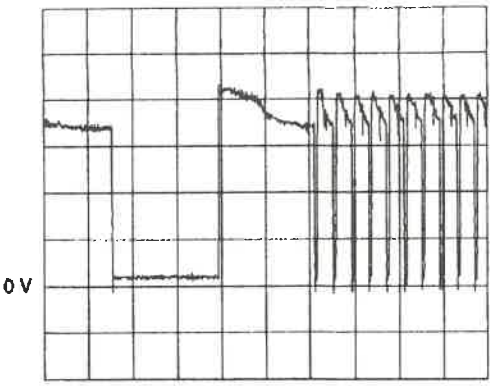
-13V SUPPLY
Q17 EMITTER/CR21 ANODE
10 V/div 10 µsec/div



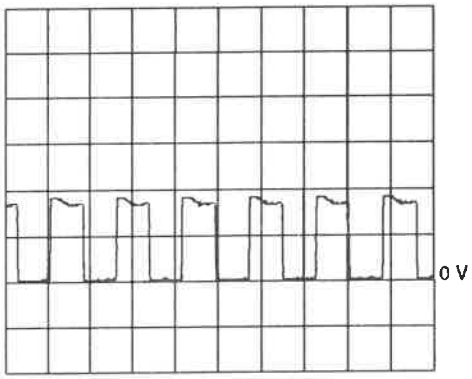
-13V SUPPLY
C62
10 V/div 20 µsec/div



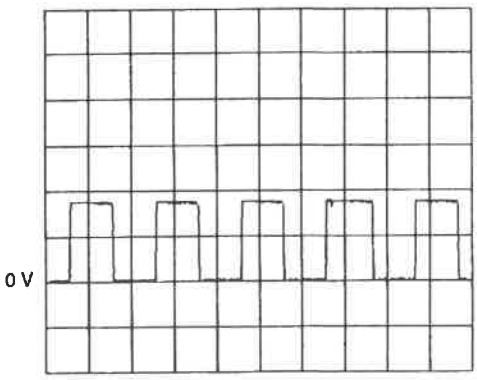
CARRIER MOTOR PHASE A
U12 PIN 1
5 V/div 5 msec/div



ELEMENT MOTOR PHASE A
U11 PIN 1
10 V/div 20 msec/div

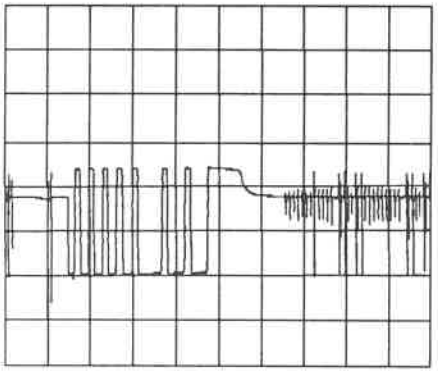


INDEX MOTOR PHASE A
U10 PIN 1
10 V/div 5 msec/div

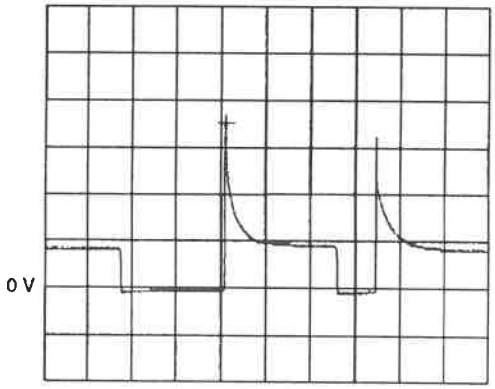


WAVE FORMS

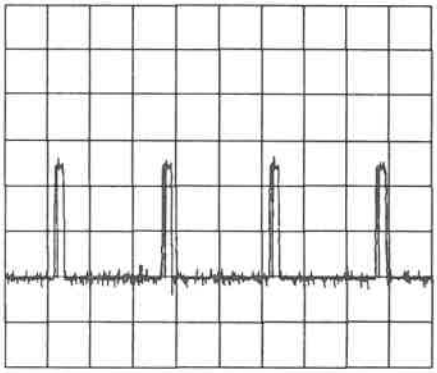
RIBBON SOLENOID PULSE
Q11 COLLECTOR
10 V/div 10 msec/div



HAMMER SOLENOID PULSE
Q1 DRAIN
20 V/div 2 msec/div

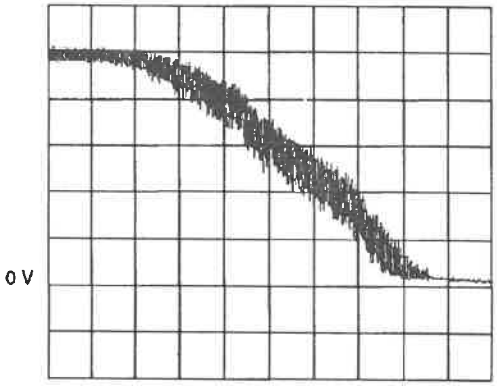


KEYBOARD SCANNING*
ROW 6
U13 PIN 38
2 V/div 2 msec/div

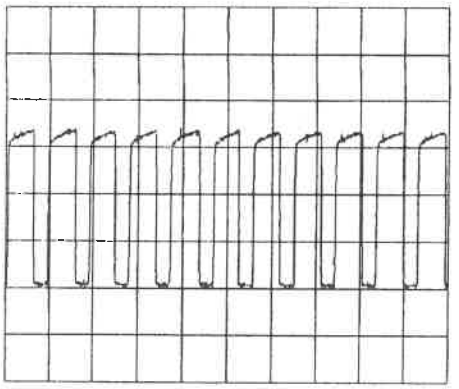


* When Key Switch is actuated.

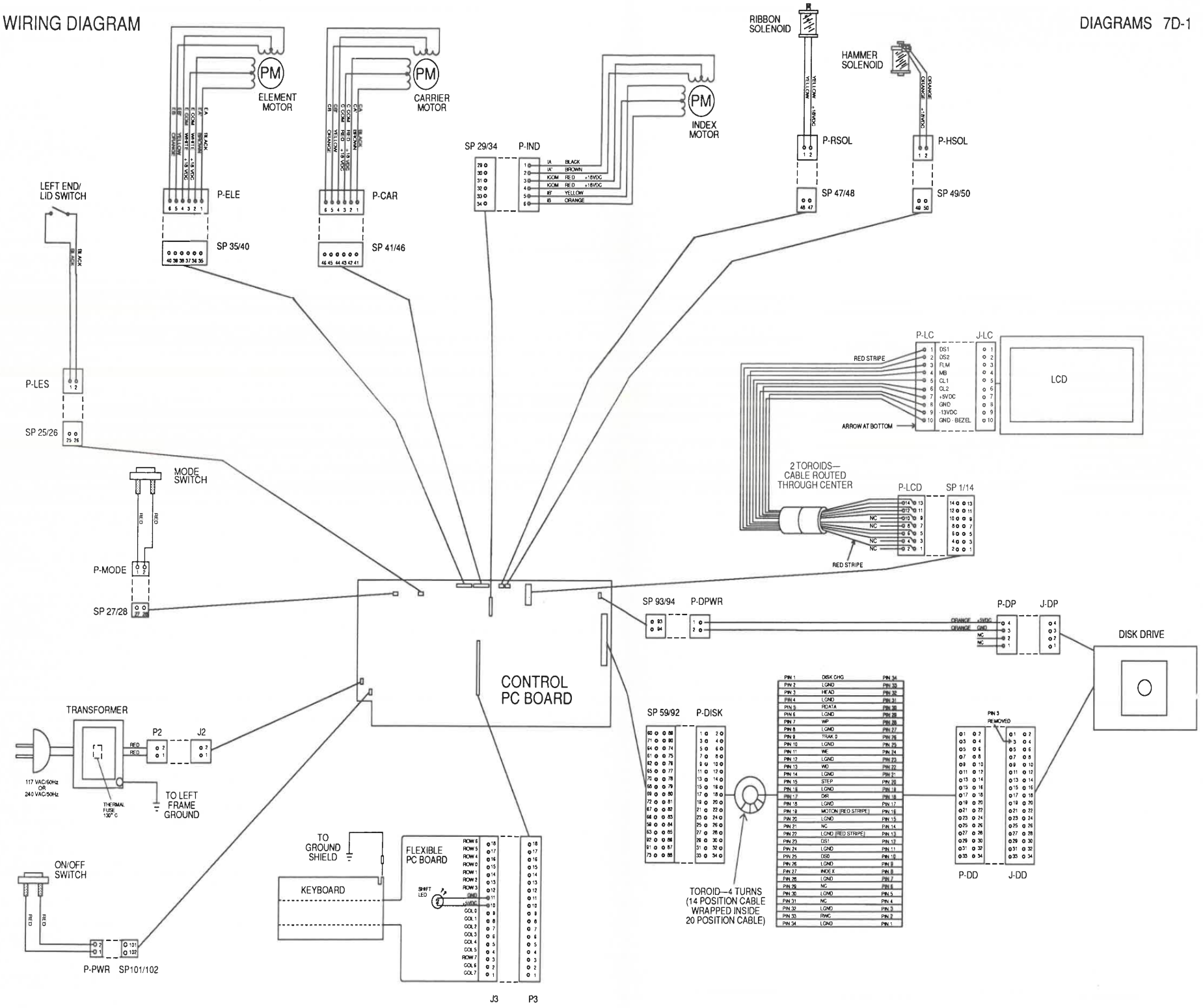
WATCHDOG TRIP
U14 PIN 8
1 V/div 5 msec/div



POWER SUPPLY
U14 PIN 14
1 V/div 20 msec/div

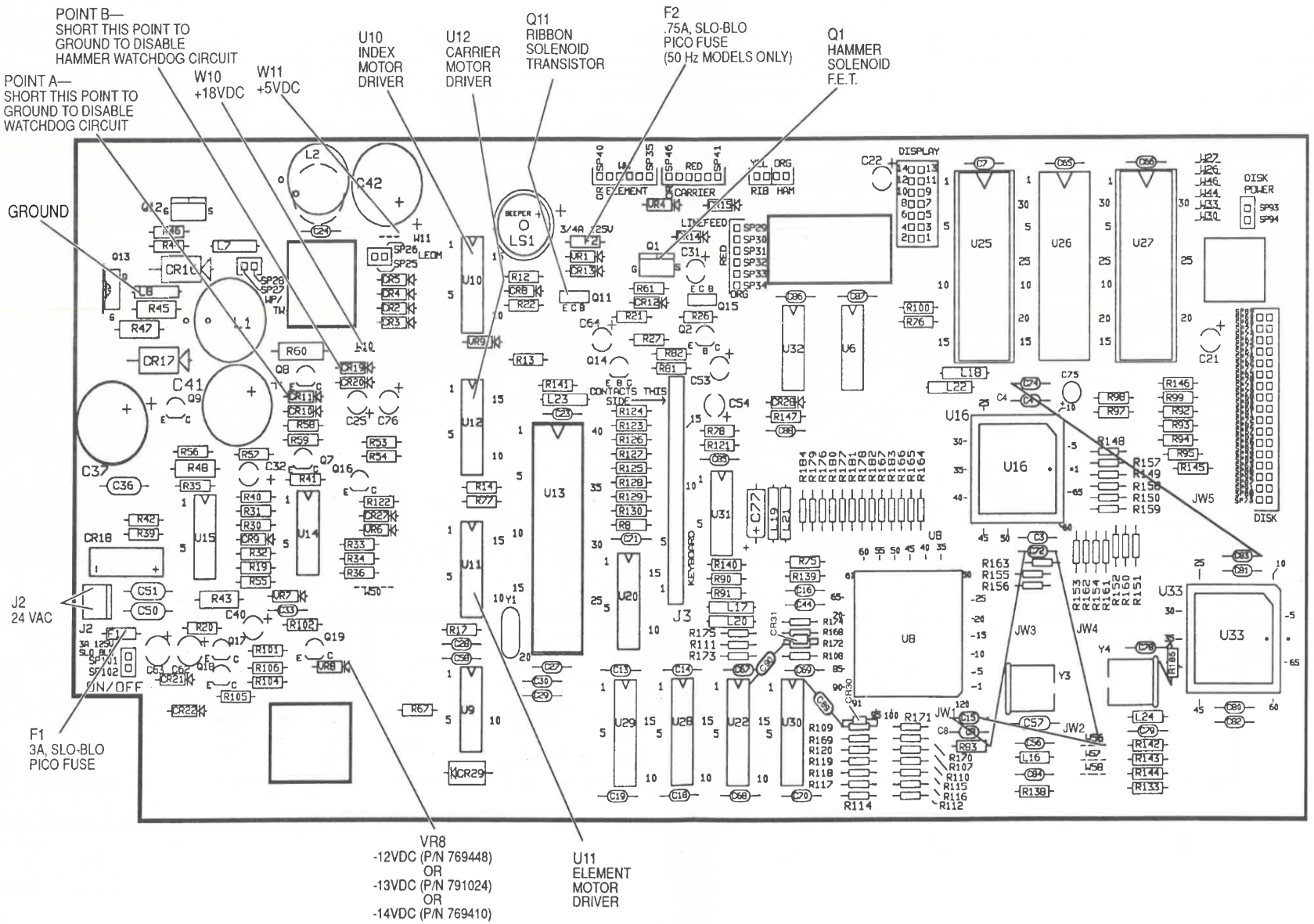


WIRING DIAGRAM



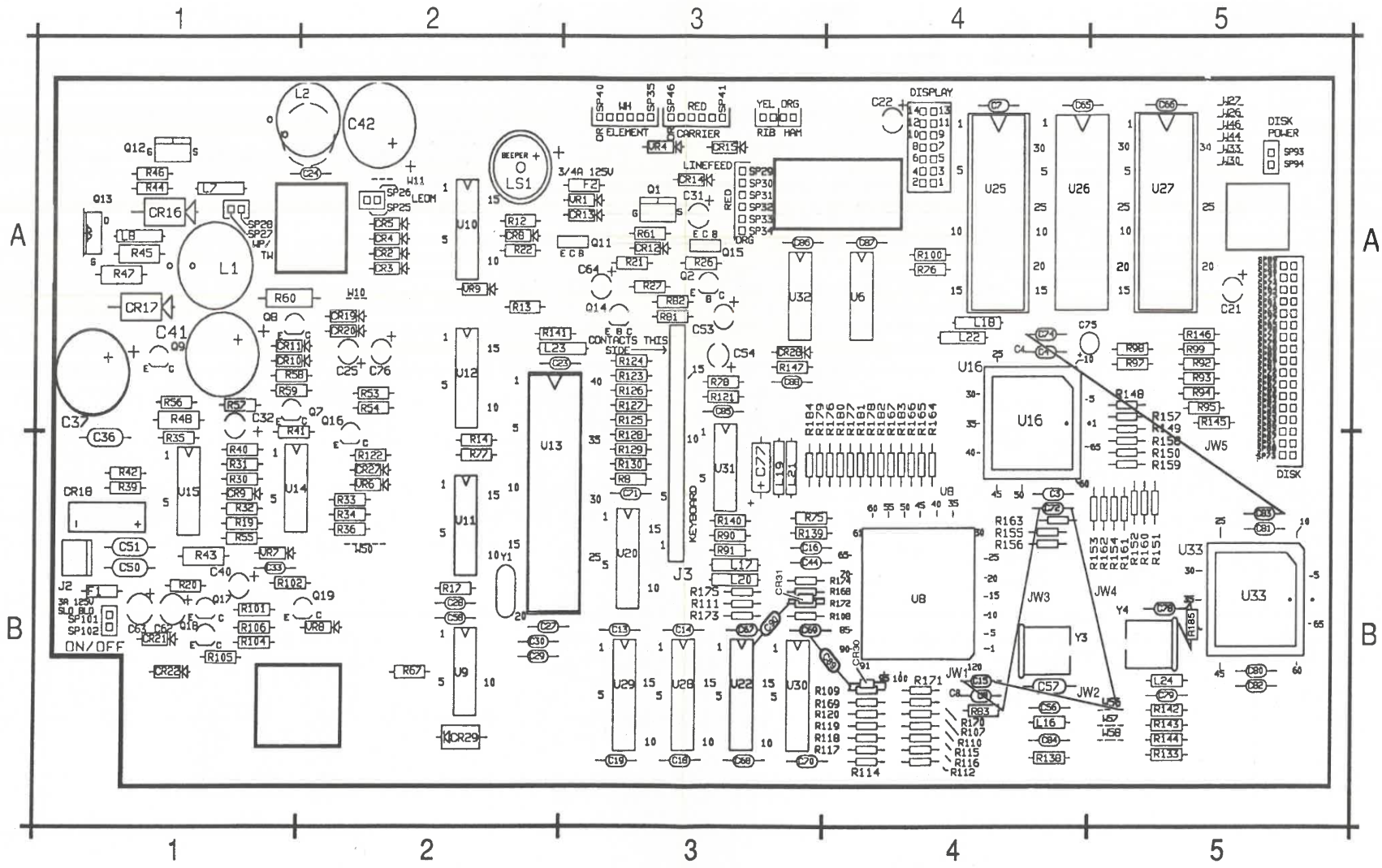
COMPONENT DIAGRAM

COMPONENT LAYOUT



COMPONENT DIAGRAM

COMPONENT LOCATION



COMPONENT DIAGRAM

COMPONENT LOCATION CHART

COMPONENT	LOCATION	COMPONENT	LOCATION	COMPONENT	LOCATION	COMPONENT	LOCATION
C3	B4	CR14	A3	R46	A1	R154	B5
C4	A4	CR15	A3	R47	A1	R155	B4
C7	A4	CR16	A1	R48	A1	R156	B4
C8	B4	CR17	A1	R53	A2	R157	A5
C13	B3	CR18	B1	R54	A2	R158	B5
C14	B3	CR19	A2	R55	B1	R159	B5
C15	B4	CR20	A2	R56	A1	R160	B5
C16	B3	CR21	B1	R57	A1	R161	B5
C18	B3	CR22	B1	R58	A1	R162	B5
C19	B3	CR27	B2	R59	A1	R163	B4
C21	A5	CR28	A3	R60	A1	R164	B4
C22	A4	CR29	B2	R61	A3	R165	B4
C23	A2	CR30	B4	R67	B2	R166	B4
C24	A2	CR31	B3	R75	B3	R167	B4
C25	A2			R76	A4	R168	B3
C27	B2	F1	B1	R77	B2	R169	B4
C28	B2	F2	A3	R78	A3	R170	B4
C29	B2			R82	A3	R171	B4
C30	B2	L1	A1	R83	B4	R172	B3
C31	A3	L2	A1	R90	B3	R173	B3
C32	A1	L7 (JUMPER)	A1	R91	B3	R174	B3
C33	B1	L8 (JUMPER)	A1	R92	A5	R175	B3
C36	B1	L16	B4	R93	A5	R176	B4
C37	A1	L17	B3	R94	A5	R177	B4
C40	B1	L18	A4	R95	A5	R178	B4
C41	A1	L19	B3	R97	A5	R179	B3
C42	A2	L20	B3	R98	A5	R180	B4
C44	B3	L21	B3	R99	A5	R181	B4
C50	B1	L22	A4	R100	A4	R182	B4
C51	B1	L23	A2	R101	B1	R183	B4
C53	A3	L24	B5	R102	B1	R184	B3
C54	A3			R104	B1	R185	B5
C56	B4	LS1(BEEPER)	A2	R105	B1		
C57	B4			R106	B1	U6	A4
C58	B2	Q1	A3	R107	B4	U8	B4
C62	B1	Q2	A3	R108	B3	U9	B2
C63	B1	Q7	A1	R109	B4	U10	A2
C64	A3	Q8	A1	R110	B4	U11	B2
C65	A4	Q9	A1	R111	B3	U12	A2
C66	A5	Q11	A3	R112	B4	U13	B2
C67	B3	Q12	A1	R114	B4	U14	B1
C68	B3	Q13	A1	R115	B4	U15	B1
C69	B3	Q14	A3	R116	B4	U16	A4
C70	B3	Q15	A3	R117	B4	U20	B3
C71	B3	Q16	A2	R118	B4	U22	B3
C72	B4	Q17	B1	R119	B4	U25	A4
C74	A4	Q18	B1	R120	B4	U26	A4
C75	A4	Q19	B2	R121	A3	U27	A5
C76	A2			R122	B2	U28	B3
C77	B3	R8	B3	R123	A3	U29	B3
C78	B5	R12	A2	R124	A3	U30	B3
C79	B5	R13	A2	R125	A3	U31	B3
C80	B5	R14	B2	R126	A3	U32	A3
C81	B5	R17	B2	R127	A3	U33	B5
C82	B5	R19	B1	R128	B3		
C83	B5	R20	B1	R129	B3	VR1	A3
C84	B4	R21	A3	R130	B3	VR4	A3
C85	A3	R22	A2	R133	B5	VR6	B2
C86	A3	R26	A3	R138	B4	VR7	B1
C87	A4	R27	A3	R139	B3	VR8	B2
C88	A3	R30	B1	R140	B3	VR9	A2
C89	B4	R31	B1	R141	A2		
C90	B3	R32	B1	R142	B5	W26	A5
		R33	B2	R143	B5	W27	A5
CR2	A2	R34	B2	R144	B5	W30	A5
CR3	A2	R35	B1	R145	A5	W44	A5
CR4	A2	R36	B2	R146	A5	W56	B5
CR5	A2	R39	B1	R147	A3	W57	B5
CR8	A2	R40	B1	R148	A5	W58	B5
CR9	B1	R41	A1	R149	A5		
CR10	A1	R42	B1	R150	B5	Y1	B2
CR11	A1	R43	B1	R151	B5	Y3	B4
CR12	A3	R44	A1	R152	B5	Y4	B5
CR13	A3	R45	A1	R153	B5		

JUMPER WIRE/ ZENER DIODE CHART

MODEL	U25	U27	W26	W27	W30	W44	W56	W57	W58	VR8
5NEA	2 MEG	2 MEG	IN	OUT	IN	IN	IN	IN	IN	769410 (1N5244B—14V)
5NEA	4 MEG	OUT	OUT	IN	OUT	IN	IN	OUT	IN	769410 (1N5244B—14V)
5NCA, 5NDA	2 MEG	2 MEG	IN	OUT	IN	IN	OUT	IN	IN	769410 (1N5244B—14V)
5NCA, 5NDA	4 MEG	OUT	OUT	IN	OUT	IN	OUT	OUT	IN	769410 (1N5244B—14V)
5NEB	2 MEG	2 MEG	IN	OUT	IN	IN	IN	IN	OUT	791024 (1N5243B—13V)
5NEB	4 MEG	OUT	OUT	IN	OUT	IN	IN	IN	OUT	791024 (1N5243B—13V)
5NCB, 5NDB	2 MEG	2 MEG	IN	OUT	IN	IN	OUT	IN	OUT	791024 (1N5243B—13V)
5NCB, 5NDB	4 MEG	OUT	OUT	IN	OUT	IN	OUT	IN	OUT	791024 (1N5243B—13V)
5NEC, 5NWC	2 MEG	2 MEG	IN	OUT	IN	IN	IN	OUT	OUT	769448 (1N5242B—12V)
5NEC, 5NWC	4 MEG	OUT	OUT	IN	OUT	IN	IN	OUT	OUT	769448 (1N5242B—12V)
5NEC (Canada Only)	2 MEG	2 MEG	IN	OUT	IN	IN	IN	OUT	OUT	791024 (1N5243B—13V)
5NCC	2 MEG	2 MEG	IN	OUT	IN	IN	OUT	OUT	OUT	791024 (1N5243B—13V)
5NCC	4 MEG	OUT	OUT	IN	OUT	IN	OUT	OUT	OUT	791024 (1N5243B—13V)
5NDC	2 MEG	2 MEG	IN	OUT	IN	IN	OUT	OUT	OUT	769448 (1N5242B—12V)
5NDC	4 MEG	OUT	OUT	IN	OUT	IN	OUT	OUT	OUT	769448 (1N5242B—12V)

SMITH CORONA

5N SERIES MODELS

PWP1200 (5NEC)
PWP125 (5NCC)
PWP57D (5NDC)
MARK 1000 (5NWC)

PWP2200 (5NEB)
PWP225 (5NCB)
PWP67D (5NDB)

PWP3200 (5NEA)
PWP325 (5NCA)
PWP77D (5NDA)

PARTS MANUAL

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PREFACE

This Parts Manual covers 5N Series Personal Word Processors. The model prefix and model names are as follows:

7 Line LCD Models:

Model Prefix	Model Name	Model Prefix	Model Name
5NEC	PWP 1200	5NEB	PWP 2200
5NCC	PWP 125	5NCB	PWP 225
5NDC	PWP 57D	5NDB	PWP 67D
5NWC	Mark 1000		

14 Line LCD Models:

Model Prefix	Model Name
5NEA	PWP 3200
5NCA	PWP 325
5NDA	PWP 77D

Unique International parts are listed separately on each page where applicable. All Keybuttons are listed on the model same page with a country designator after the item identification description -- see the Keyboard Codes at the top of each page for Color and Country.

A Reference Number is used on parts illustrations, and a Component Number is used for each Component on the Control PC Board diagrams. The number is listed numerically in the parts listing beneath the illustration or diagram, and refers directly to the part number.

When an illustrated part has variations in appearance, color, voltage, etc., the reference number appears more than once in the "REF" or "COMPONENT" column. Use extreme care in selecting parts in these areas.

If the part number is known, the page on which it is listed can readily be found by reference to the numerical parts listing at the end of the Manual.

Ordering Instructions: State the correct part number on all parts orders. State additional information if asked for. It is not necessary to state the part name unless the part number is not known. **Do not** order by reference numbers.

Notice

Smith Corona encourages PC Board repair by qualified technicians. If, however, after trying to repair a PC Board, the Board still does not work properly, return the Board to Smith Corona National Service Stores for warranty or repair exchange.

Important: Smith Corona does not replace or exchange damaged PC Boards (in or out of warranty).

Boards will be returned as irreparable and no credits or exchanges issued when:

- There are missing components
- There are damaged or lifted traces
- There are solder burns
- There is any other Board damage which makes the Board irreparable

. . . . . Smith Corona reserves the right to discontinue parts at any time and/or to furnish substitutes.

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Cassette and Correction Ribbon	10
Hammer	11
Paper Feed	12
Disk Drive & Transformer	13
Control PC Board	14
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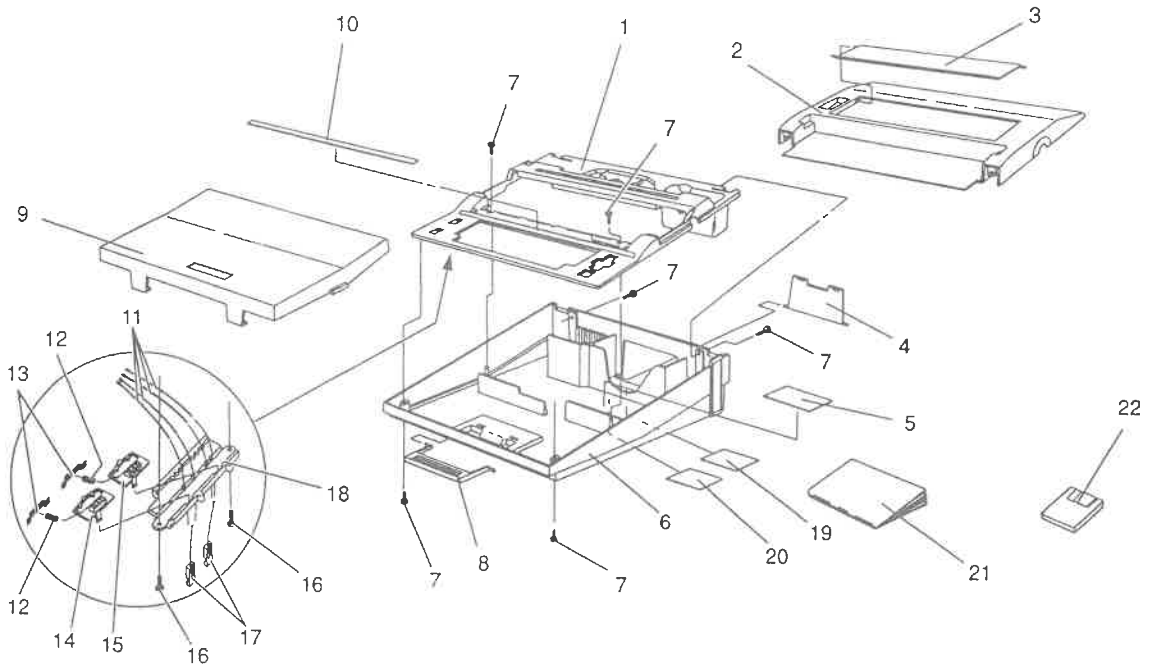
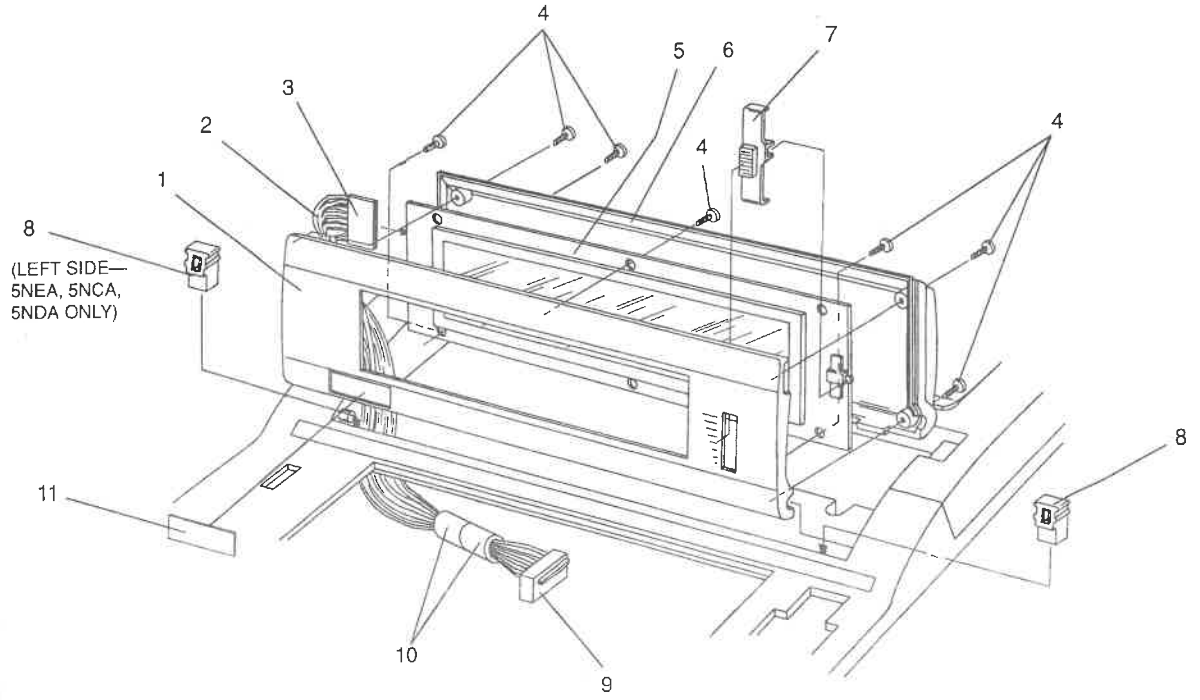
JACKETS



REF	PART NUMBER	PART NAME	QTY
1	792381	Mask, Accent Gray	1
2	792483	Deck, Silver Ash, Models 5NEB, 5NDB, 5NEC, 5NDC, 5NWC	1
2	792484	Deck, Silver Fog, Models 5NCB, 5NCC	1
2	793450	Deck, Silver Ash, Models 5NEA, 5NDA	1
2	793451	Deck, Silver Fog, Model 5NCA	1
3	792490	Paper Support, Silver Ash, Models 5NEB, 5NDB, 5NEC, 5NDC, 5NWC	1
3	792491	Paper Support, Silver Fog, Models 5NCB, 5NCC	1
3	793440	Paper Support, Silver Ash, Models 5NEA, 5NDA	1
3	793441	Paper Support, Silver Fog, Model 5NCA	1
4	791721	Cord Storage Door, Silver Fog	1
4	791723	Cord Storage Door, Silver Ash	1
5	794811	Warning Label	1
6	793610	Casing Base, Silver Ash, w/Ref 4 & Ref 8	1
6	793611	Casing Base, Silver Fog, w/Ref 4 & Ref 8	1
7	747258	Screw	6
8	768150	Handle, Carrying Case, Silver Fog	1
8	768153	Handle, Carrying Case, Silver Ash	1
9	790391	Keyboard Cover, Silver Fog	1
9	790392	Keyboard Cover, Silver Ash	1
10	791544	Overlay	1
11	776575	Switch Lead Assembly	4
12	776600	Compression Spring	2
13	776601	Sliding Contact	2
14	792311	Lower Switch Actuator	1
15	792321	Upper Switch Actuator	1
16	770672	Screw	2
17	736901	Connector, 2 Position	2
18	792301	Switch Plate	1
19	774465	Electric Rating Label, USA, Span/Am	1
20	772118	Patent Numbers Label	1
		Owner's Manuals	
21	794022	Owner's Manual, USA Models 5NEB, 5NCB, 5NDB	1
21	794023	Owner's Manual, Canada, 5NEB	1
21	794026	Owner's Manual, USA Models 5NEA, 5NCA, 5NDA	1
21	794027	Owner's Manual, Canada, 5NEA	1
21	794028	Owner's Manual, UK, Australia, 5NEA	1
21	794029	Owner's Manual, Span/Am, 5NEA	1
21	794044	Owner's Manual, USA Models 5NEC, 5NCC, 5NDC, 5NWC	1
		Tutorial Disks	
22	769370	Tutorial Disk, USA, 5NEB, 5NCB, 5NDB, 5NEC, 5NCC, 5NDC, 5NWC	1
22	769371	Tutorial Disk, USA, Models 5NEA, 5NCA, 5NDA	1
22	769372	Tutorial Disk, UK, Australia, 5NEA	1
22	769373	Tutorial Disk, Spanish/American, 5NEA	1
22	769374	Tutorial Disk, Canada, 5NEA	1
22	769387	Tutorial Disk, Canada, 5NEB	1
		International Parts	
1	792382	Mask, Accent Gray, UK, Australia	1
2	793452	Deck, Silver Ash, UK, Aust, 5NEA	1
3	793442	Paper Support, Silver Ash, United Kingdom, Australia, 5NEA	1
6	793612	Casing Base, Silver Ash, w/Ref 4 & Ref 8, UK, Australia	1
19	774466	Electric Rating Label, Canada	1
19	774473	Electric Rating Label, UK, Australia	1

LCD ASSEMBLY



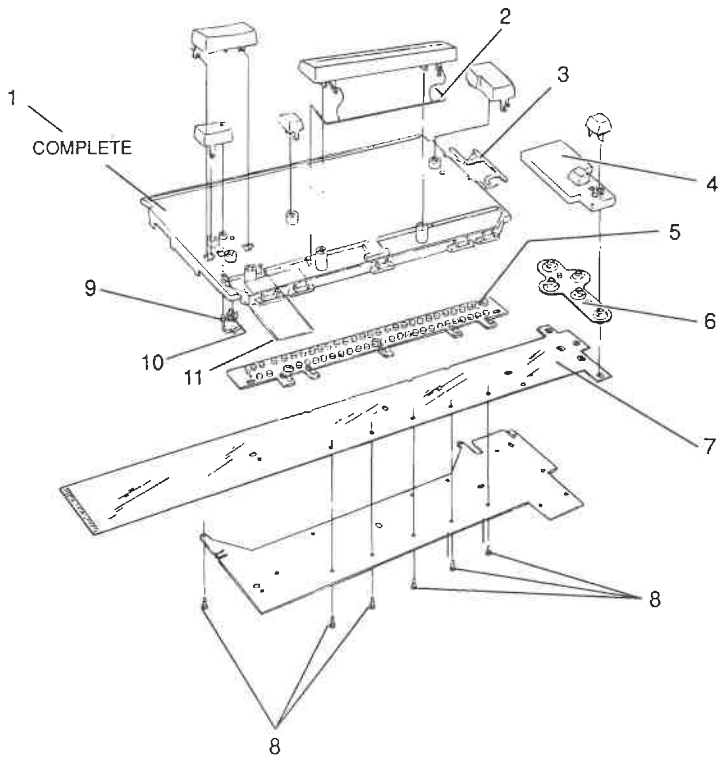
REF	PART NUMBER	PART NAME	QTY
1	790467	Upper LCD Housing, Silver Ash, Model 5NEC	1
1	790469	Upper LCD Housing, Silver Fog, Model 5NCB	1
1	790470	Upper LCD Housing, Silver Ash, Model 5NDB	1
1	790471	Upper LCD Housing, Silver Ash, Model 5NEB	1
1	790472	Upper LCD Housing, Silver Fog, Model 5NCC	1
1	790473	Upper LCD Housing, Silver Ash, Model 5NWC	1
1	790474	Upper LCD Housing, Silver Ash, Model 5NDC	1
1	790475	Upper LCD Housing, Silver Ash, Model 5NEA	1
1	790477	Upper LCD Housing, Silver Fog, Model 5NCA	1
1	790478	Upper LCD Housing, Silver Ash, Model 5NDA	1
2	793004	LCD Cable Assembly, w/Ref 3, Ref 9, & Ref 10	1
3	760804	Connector, 10 Position	1
4	770672	Self Tap Screw	7
5	790318	LCD, 480 x 64, Models 5NEC, 5NCC, 5NDC, 5NWC (See note)	1
5	790319	LCD, 480 x 64, Models 5NEB, 5NCB, 5NDB (See note)	1
5	790320	LCD, 480 x 64, Models 5NEB, 5NCB, 5NDB, 5NCC, 5NDC (See note)	1
5	793342	LCD, 480 x 128, Models 5NEA, 5NCA, 5NDA (See note)	1
6	790381	Lower LCD Housing, Silver Fog, 5NCB, 5NCC	1
6	790383	Lower LCD Housing, Silver Ash, 5NEB, 5NDB, 5NEC, 5NDC, 5NWC	1
6	793430	Lower LCD Housing, Silver Ash, 5NEA, 5NDA	1
6	793431	Lower LCD Housing, Silver Fog, 5NCA	1
7	790417	Contrast Slider Switch, Silver Fog, Models 5NCB, 5NCC	1
7	790418	Contrast Slider Switch, Silver Ash, 5NEB, 5NDB, 5NEC, 5NDC, 5NWC	1
7	793500	Contrast Slider Switch, Silver Ash, Models 5NEA, 5NDA	1
7	793501	Contrast Slider Switch, Silver Fog, Model 5NCA	1
8	768308	LCD Housing Brake, 5NEB, 5NCB, 5NDB, 5NEC, 5NCC, 5NDC, 5NWC	1
8	768308	LCD Housing Brake, Models 5NEA, 5NCA, 5NDA	2
9	781562	Connector, 14 Pin, Dual Row	1
10	769446	Toroid	2
11	900240	Nameplate	1

International Parts

1	790476	Upper LCD Housing, Silver Ash, Model 5NEA, UK, Australia	1
6	793432	Lower LCD Housing, Silver Ash, Model 5NEA, UK, Australia	1

Note: When ordering LCD's, refer to the part number Label on the LCD PC Board to assure receipt of the proper replacement part. Also, refer to the PC Board Components to assure that the correct Zener Diode is in Position VR8.

KEYBOARD



REF	PART NUMBER	PART NAME	QTY
1	779137	Keyboard Complete, Silver Ash, USA	1
2	778281	Spacebar Bail	1
3	778815	Return Bail	1
4	779060	Keypad Body	1
5	778814	Molded Switches	1
6	779061	Molded Switches, Keypad	1
7	779062	Flexible Circuit	1
8	778807	Self Tap Screw	13
9	778316	LED, Green	1
10	778347	LED Contact Washer	1
11	778282	Left Shift Bail	1

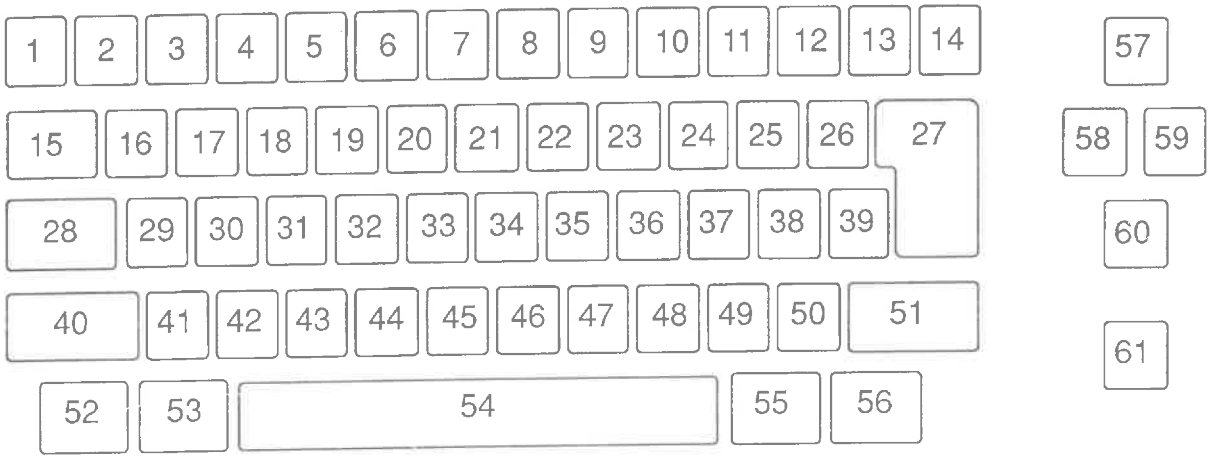
REF	PART NUMBER	PART NAME	QTY
		Keyboards for International Models Only	
1	779161	Keyboard Complete, Silver Ash, Canada	1
1	779169	Keyboard Complete, Silver Ash, Spanish/American	1
1	779380	Keyboard Complete, Silver Ash, United Kingdom, Australia	1

KEYBUTTON REFERENCE CHART

KEYBOARD CODES

COUNTRY	KEYBOARD	CODE
USA	1063	US
CANADA	1133	CAN
UK & AUSTRALIA	5108	UK
SPANISH AMERICA & CHILE	1492	SA

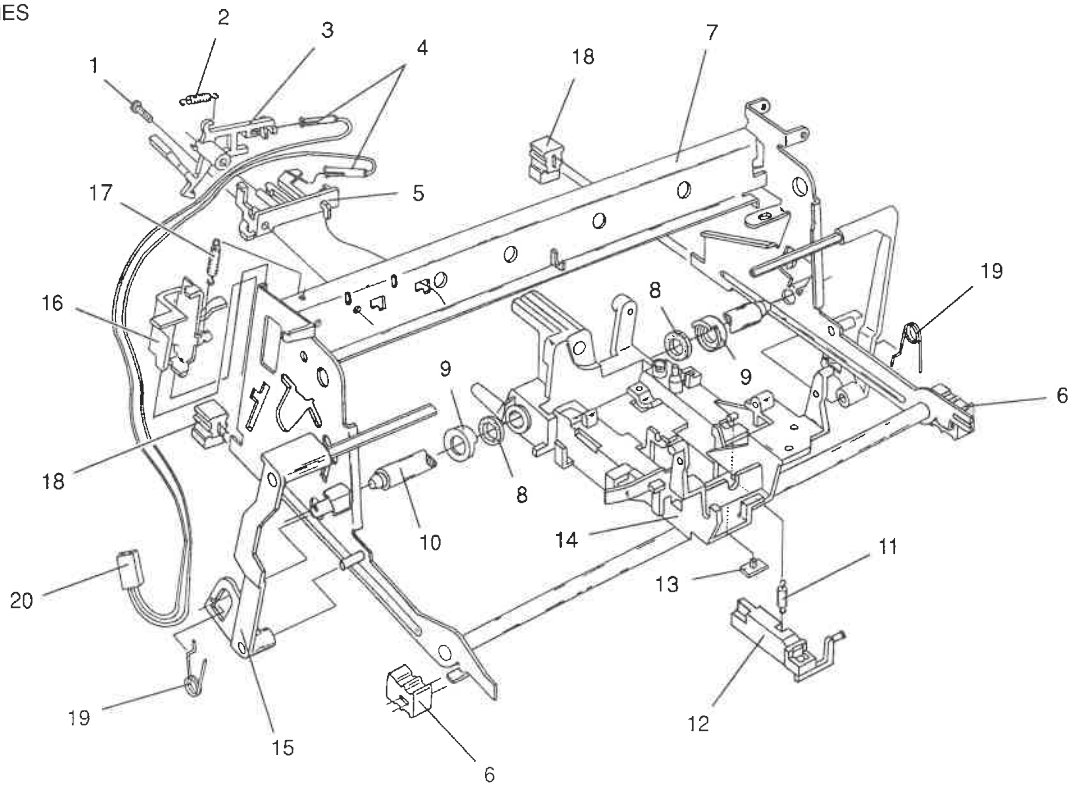
KEYBOARD COLOR
SILVER ASH



REF	PART NUMBER	ITEM
1	779685	Exit
2	779501	! / 1 US, UK, SA
3	779502	@ / 2 US, UK
4	779503	# / 3 US, SA
5	779504	$ / 4
6	779505	% / 5
7	779506	¢ / 6 US, UK
8	779507	& / 7
9	779508	* / 8 US, UK
10	779509	(/ 9
11	779510	) / 0
12	779511	_ / -
13	779512	+ / =
14	779513	Backspace
15	779664	Tab
16	779613	Q
17	779614	W
18	779615	E
19	779616	R
20	779617	T
21	779618	Y
22	779686	U / Undo
23	779568	I
24	779687	O / Super
25	779688	P / Sub
26	779620	¼ / ½ US, CAN
27	779689	Return/Enter
28	779527	Lock
29	779528	A
30	779622	S / Stop
31	779599	D / Dictionary
32	779600	F / Find
33	779690	G / Go To
34	779533	H
35	779534	J
36	779623	K / KB II
37	779624	L / List
38	779537	: / ; US, CAN, UK
39	779625	" / ' US
40	779593	Shift Left/Paper In
41	779540	Z
42	779541	X
43	779691	C / Copy
44	779692	V / Vol
45	779544	B / Bold
46	779627	N / Next
47	779693	M / Move
48	779547	, / <
49	779653	. / > / [US, UK
50	779654	? over / over] US, UK
51	779550	Shift, Right
52	779551	Code
53	779694	Select
54	778264	Spacebar
55	779602	Worderaser/Lineraser
56	779695	Delete
57	779696	↑ / Scrn
58	779697	← / Word
59	779698	→ / Word
60	779699	↓ / Scrn
61	779684	Adv

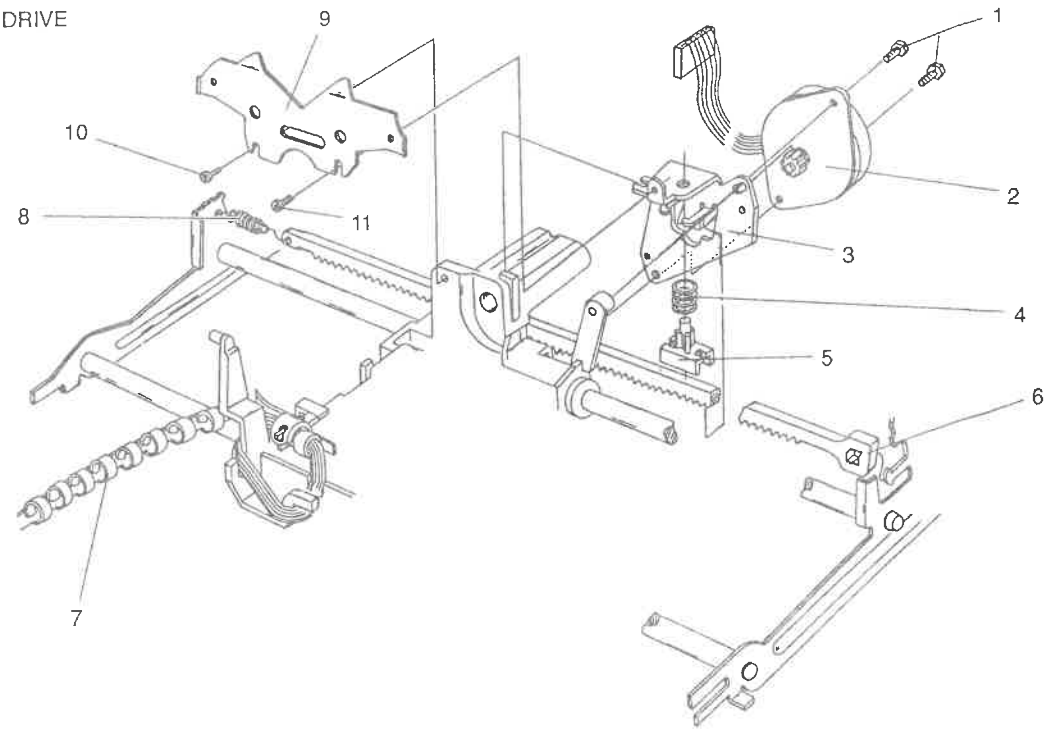
REF	PART NUMBER	ITEM
		Unique International Keybuttons
2	779556	# / 1 CAN
3	779557	" / 2 CAN, SA
4	779558	/ over 3 CAN
4	779584	£ / 3 UK
7	779559	* / 6 CAN, SA
9	779560	' / 8 CAN, SA
26	779579	¨ / ´ over / SA
26	779591	¼ / ½ / ⅓ UK
38	779580	Ñ SA
39	779581	: / ; / ¡ SA
39	779700	! / ? CAN
39	779592	" / ' / ¾ UK
48	779582	° / , SA
49	779548	. / . CAN, SA
50	779583	? / ¿ SA
50	779701	` / é CAN

CARRIER MOLDING, RAILS,
AND FRAMES



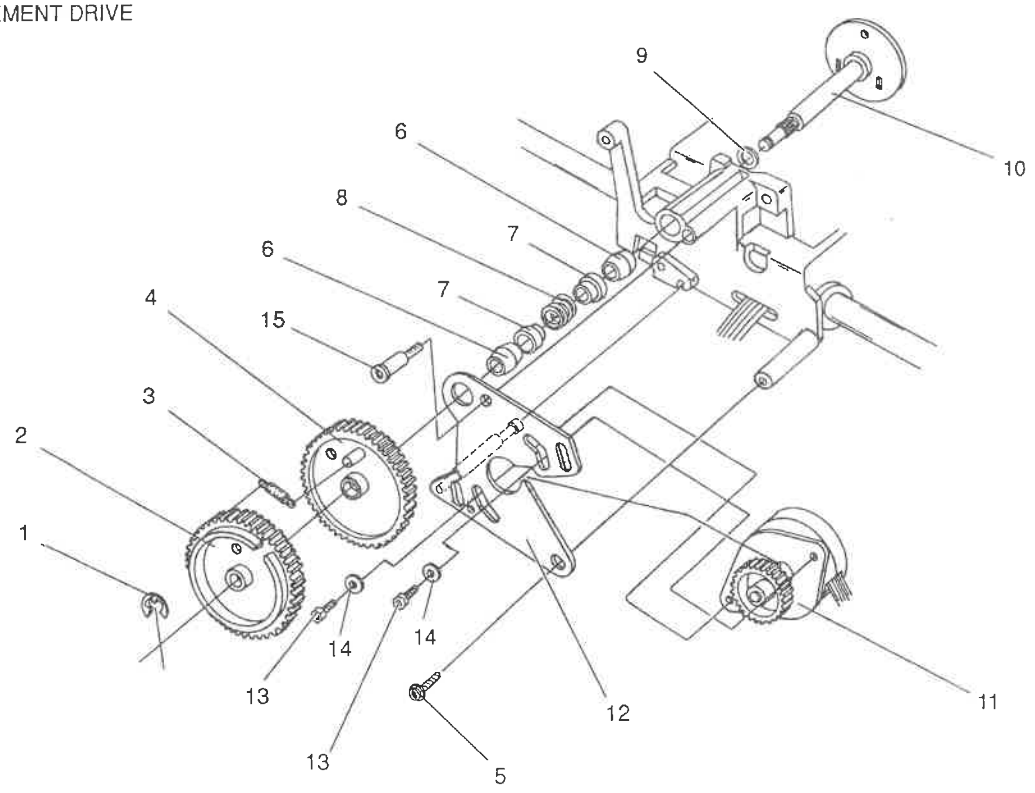
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	783194	Self Tap Screw	1	11	771617	Spring	1
2	133250	Spring	1	12	776571	Carrier Restraint	1
3	783190	Left End Switch Latch	1	13	780411	Slider	1
4	775217	Left End Switch Assembly, w/Ref 20	1	14	777018	Molded Carrier, w/Ref 13	1
5	783191	Left End Switch Bracket	1	15	790454	Forward Pivot Paper Bail	1
6	770435	Foot, Front	2	16	771465	Actuator	1
7	790857	Frame Assembly Complete	1	17	771271	Spring	1
8	740084	Wiper	2	18	783000	Foot, Rear	2
9	740257	Wiper Retainer	2	19	790327	Bail Spring	2
10	783197	Rear Carrier Shaft	1	20	365319	Connector, 2 Pin	1

CARRIER DRIVE



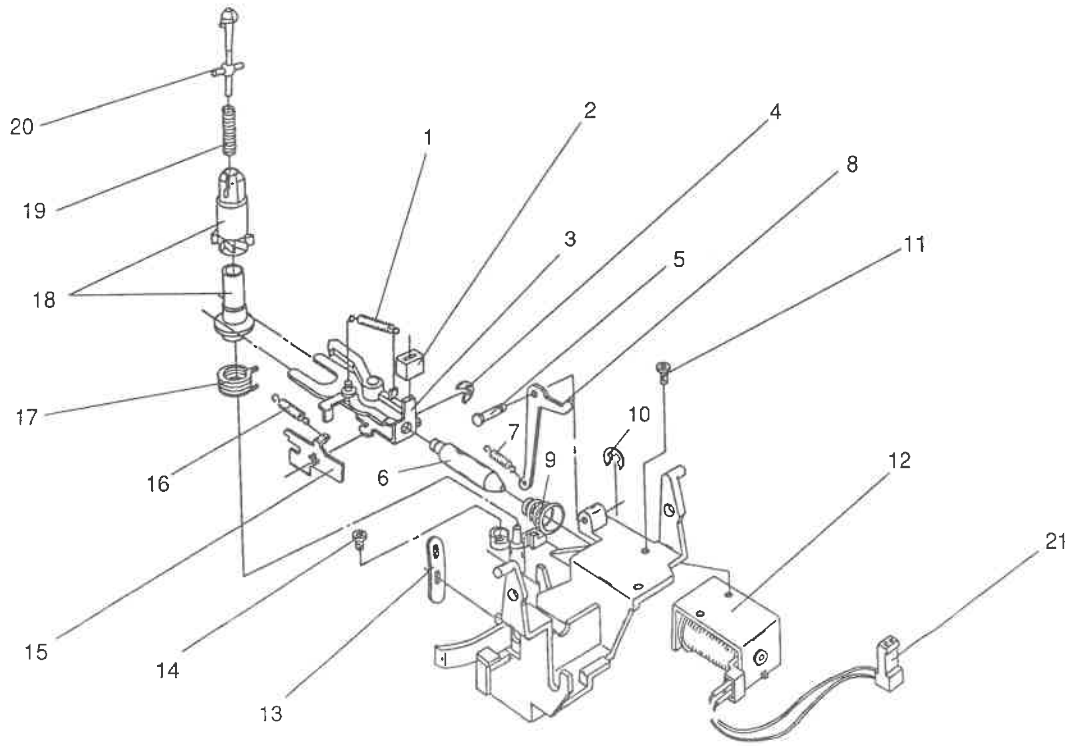
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	747258	Carrier Motor Screw	2	7	770317	Wire Binder Retainer	1
2	770173	Carrier Motor Assembly	1	8	783136	Spring	1
3	777307	Carrier Return Bracket	1	9	901212	Line Indicator	1
4	751719	Spring	1	10	770672	Self Tap Screw	1
5	768671	Anti-Backlash Slider	1	11	781910	Screw	1
6	768669	Carrier Drive Rack	1				

ELEMENT DRIVE



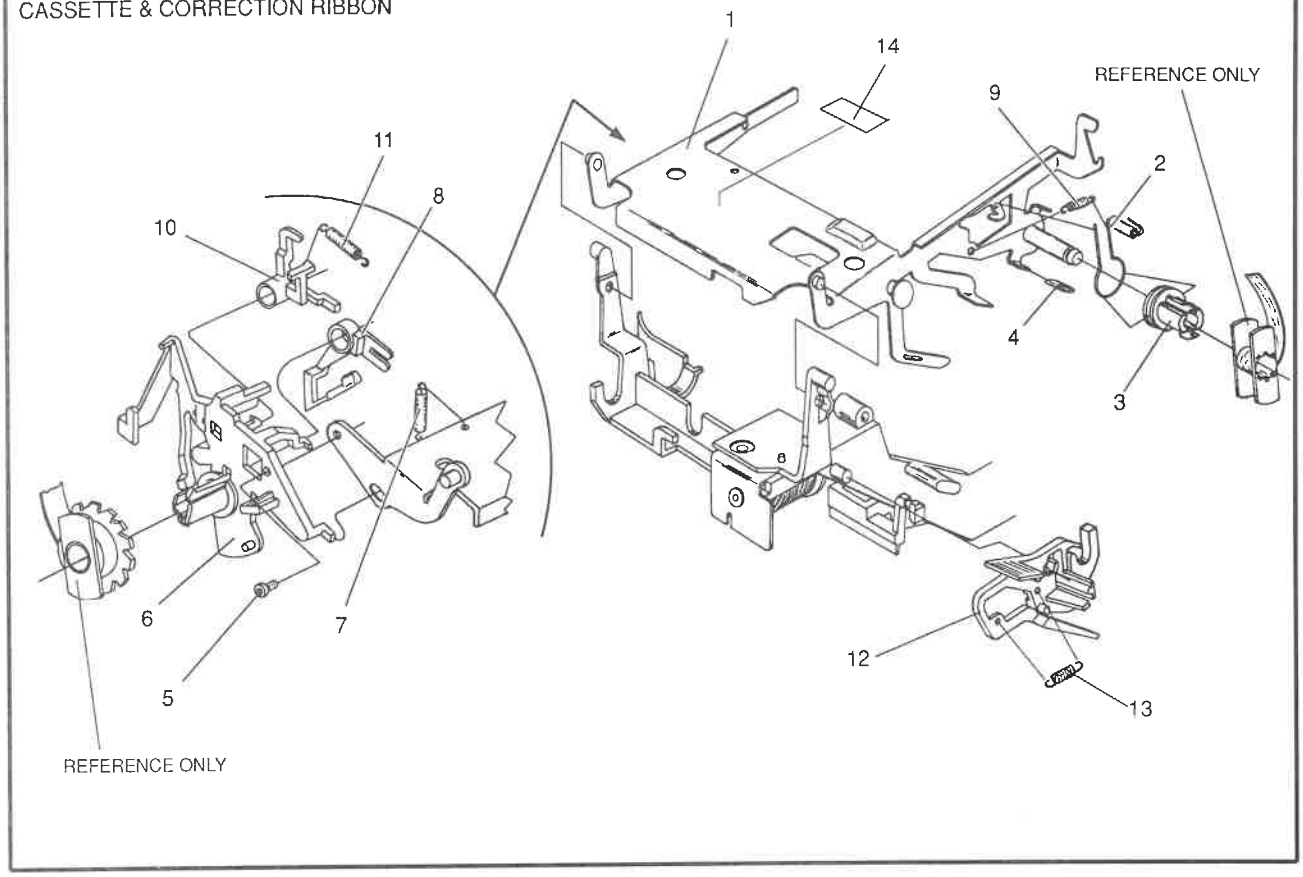
REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	467980	E-Ring	1	9	752735	Thrust Washer	1
2	749965	Outside Scissor Gear	1	10	740004	Element Drive Shaft	1
3	771260	Element Gear Spring	1	11	774871	Element Motor Assembly	1
4	745321	Inside Scissor Gear	1	12	790001	Element Motor Plate	1
5	747258	Self Tap Screw	1	13	770297	Screw	2
6	740143	Bearing	2	14	105090	Flat Washer	2
7	752734	Bearing Retainer	2	15	790008	Shoulder Screw	1
8	782619	Spring	1				

RIBBON DRIVE



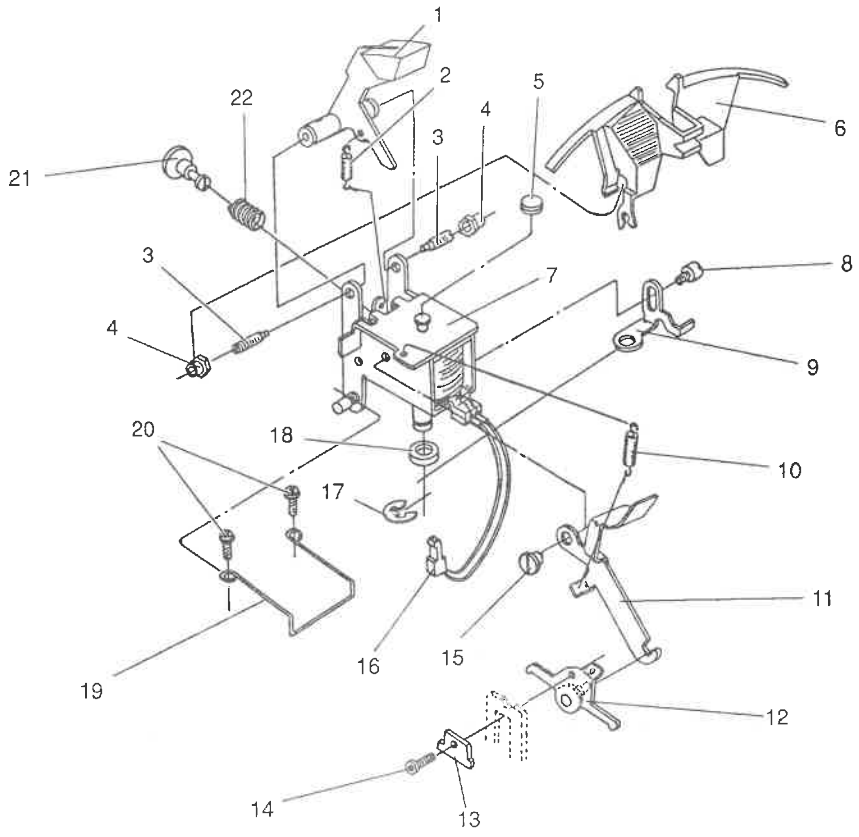
REF	PART NUMBER	PART NAME	QTY
1	740111	Spring	1
2	781725	Bumper	1
3	770290	Ribbon Feed Assembly	1
4	467980	E-Ring	1
5	777005	Correction Stud	1
6	771411	Ribbon Feed Plunger	1
7	428090	Spring	1
8	770294	Correction Lift Bellcrank	1
9	770277	Plunger Spring	1
10	102271	E-Ring	1
11	777242	Self Tap Screw	1
12	782122	Ribbon Drive Solenoid, w/Ref 21	1
13	770298	Wire Strap	1
14	747258	Self Tap Screw	1
15	790338	Cassette Feed Pawl Latch	1
16	771464	Spring	1
17	770833	Anti-Backup Spring	1
18	770189	Ribbon Feed Shaft Assembly	1
19	749841	Spring	1
20	770292	Ribbon Driver	1
21	365319	Connector, 2 Pin	1

CASSETTE & CORRECTION RIBBON



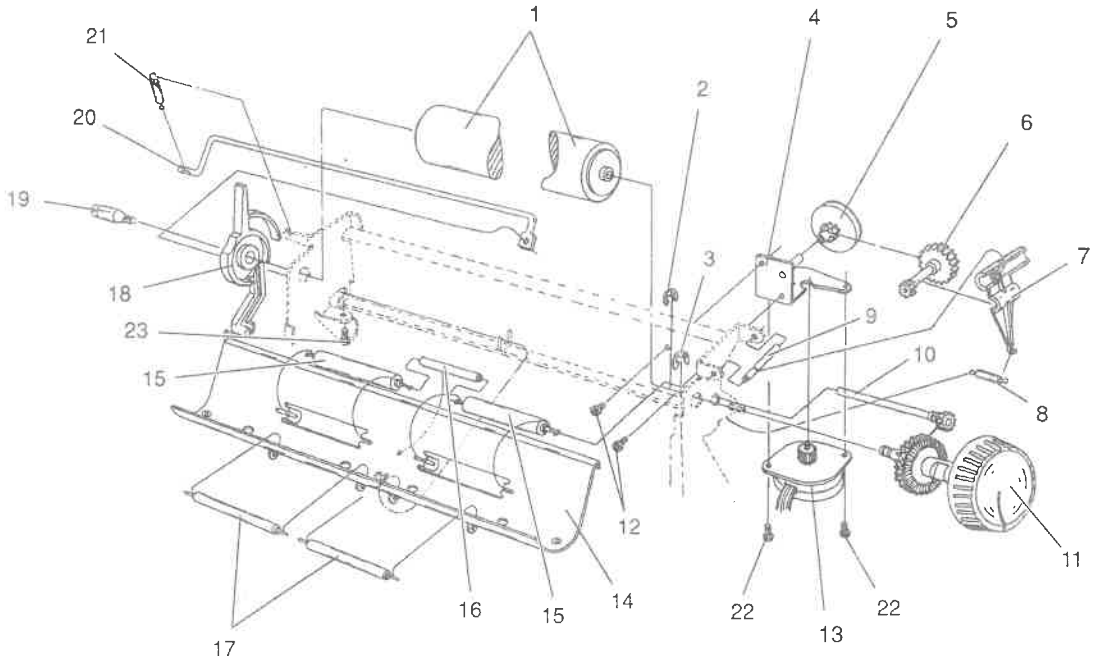
REF	PART NUMBER	PART NAME	QTY
1	766362	Correction Bail Assembly	1
2	771502	Correction Brake Spring	1
3	740108	Correction Spool Hub	1
4	749494	Vinyl Tubing	1
5	771466	Screw	1
6	770293	Left Correction Arm	1
7	770686	Spring	1
8	770288	Correction Feed Pawl	1
9	428090	Spring	1
10	770291	Cassette Latch	1
11	740111	Spring	1
12	793350	Carrier Restraint Latch	1
13	777002	Spring	1
		International Only	
14	792234	Caution: Hot Label, United Kingdom, Australia	1

HAMMER



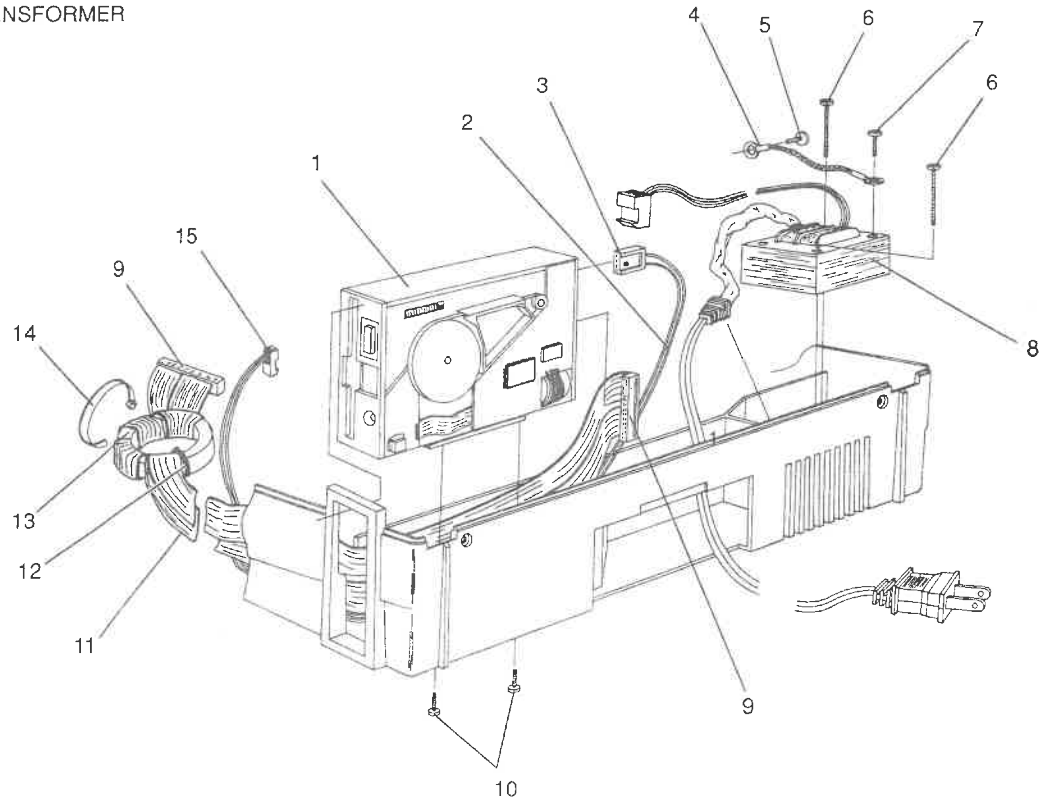
REF	PART NUMBER	PART NAME	QTY
1	790337	Hammer	1
2	746485	Hammer Spring	1
3	771794	Pivot Screw	2
4	770296	Pivot Nut	2
5	772020	Plunger Cap	1
6	771836	Ribbon Guide	1
7	790375	Hammer Solenoid Complete, w/Ref 16	1
8	772920	Screw	1
9	770162	Latch Trip	1
10	771419	Spring	1
11	774502	Hammer Latch Lever	1
12	770432	Hammer Plate	1
13	770280	Washer	1
14	770297	Screw	1
15	771469	Screw	1
16	365319	Connector, 2 Pin	1
17	771463	E-Ring	1
18	748562	O-Ring	1
19	749789	Hammer Solenoid Retainer	1
20	747258	Self Tap Screw	2
21	749735	Printwheel Pusher	1
22	770924	Pusher Spring	1

PAPER FEED



REF	PART NUMBER	PART NAME	QTY	REF	PART NUMBER	PART NAME	QTY
1	790930	Platen Assembly	1	12	771466	Self Tap Screw	2
2	105100	E-Ring	1	13	770183	Index Motor Assembly	1
3	771930	E-Ring	1	14	753587	Paper Table, Nickel	1
4	783199	Linespace Bracket	1	15	790801	Paper Feed Roller, Rear	2
5	770165	Pinion Face Gear	1	16	790805	Link	1
6	750056	Linespace Pinion	1	17	771611	Paper Feed Roller, Front	2
7	771462	Linespace Pinion Pivot	1	18	791941	Paper Release Lever, Accent Gray	1
8	770199	Linespace Pinion Pivot Spring	1	19	750075	Left Platen Shaft	1
9	771460	Pinion Pivot Pin	1	20	783204	Paper Release Shaft	1
10	790807	Drive Shaft, Gear	1	21	751437	Paper Release Spring	1
11	790830	Platen Knob Assembly, w/Gear, Accent Gray	1	22	771461	Self Tap Screw	2
				23	781557	Self Tap Screw	1

DISK DRIVE &
TRANSFORMER



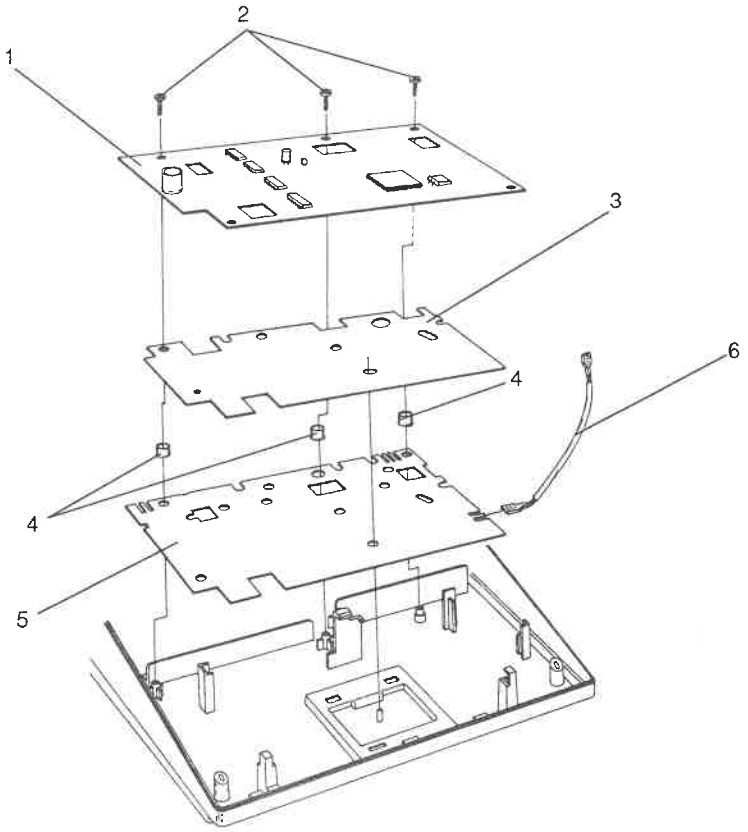
REF	PART NUMBER	PART NAME	QTY
1	769270	Disk Drive, 3.5", Double Sided, Double Density	1
2	921990	Disk Drive Power Cable, w/Ref 3 & Ref 15	1
3	950676	Connector, 4 Position	1
4	760923	Ground Cable	1
5	781910	Self Tap Screw	1
6	782219	Transformer Screw	2
7	781952	Self Tap Screw	1
8	783450	Transformer Assembly, with Attached Line Cord, 120V/60Hz, USA, Canada, Spanish/American	1
9	950686	Connector, 34 Position, Dual Row	2
10	950542	Screw	2
11	951203	Disk Drive Cable, w/Ref 9, Ref 12, & Ref 13	1
12	700523	Cable Tie	1
13	769447	Toroid	1
14	701358	Cable Tie	1
15	736901	Connector, 2 Position	1

International Parts

REF	PART NUMBER	PART NAME	QTY
8	910889	Transformer Assembly, 240V/50Hz, with Attached Line Cord, United Kingdom (See note)	1
8	910984	Transformer Assembly, 240V/50Hz, with attached Line Cord, Australia (See note)	1

Note: International Transformers are available for sale ***only*** to International Distributors.

CONTROL PC BOARD



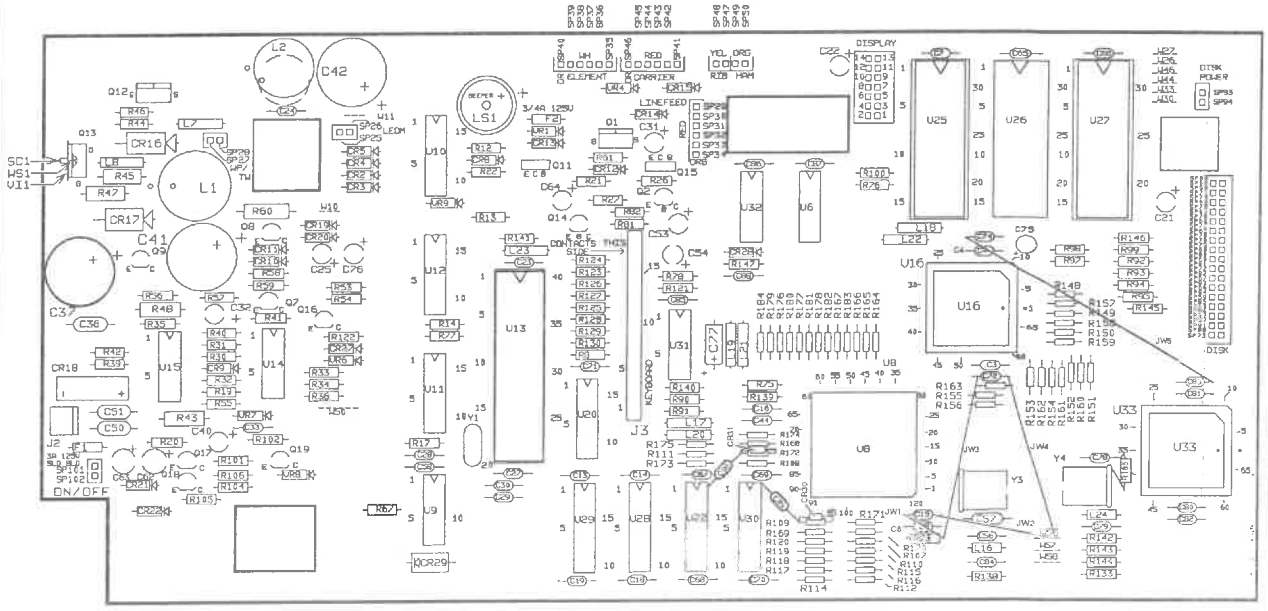
REF	PART NUMBER	PART NAME	QTY
1	792563	Control PC Board, USA, Models 5NEB, 5NCB, 5NDB, 5NEC, 5NCC, 5NDC, 5NWC	1
1	792572	Control PC Board, USA, Models 5NEA, 5NCA, 5NDA	1
2	747258	Screw	3
3	793587	Insulator	1
4	921680	Standoff	3
5	790422	Ground Shield	1
6	761224	Ground Cable Assembly	1

REF	PART NUMBER	PART NAME	QTY
1	792564	Control PC Board, Canada, Spanish/American, United Kingdom, Australia (See note #1)	1

Note #1: International Control PC Boards are supplied with Sockets in Positions U25, U26, & U27. Refer to page 17 to order the appropriate U25, U26, & U27 for each model and country.

CONTROL PC
BOARD COMPONENTS

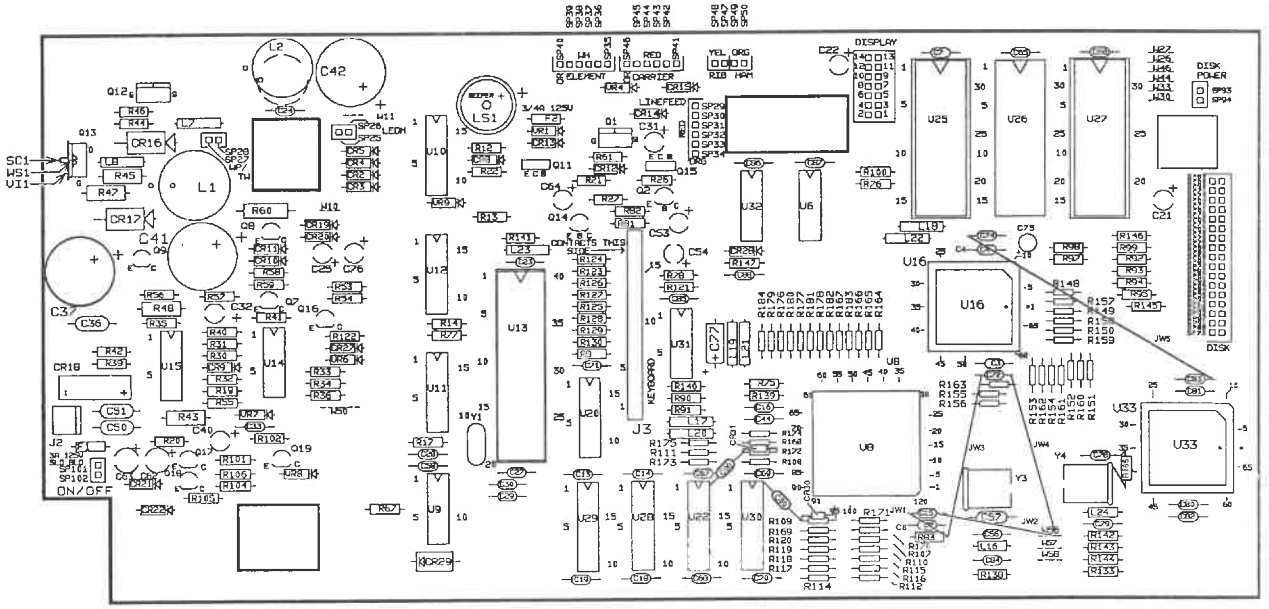
P/N 792563—USA (5NEC, 5NCC, 5NDC, 5NWC, 5NEB, 5NCB, 5NDB)
P/N 792572—USA (5NEA, 5NCA, 5NDA)
P/N 792564—INTERNATIONAL



COMPONENT	PART NUMBER	DESCRIPTION
C3, C4, C13-C16, C27, C58, C67, C69, C71, C82, C83, C85-C87	700341	Capacitor, .01µF/50V, Axial, Ceramic, ± 20%
C7, C8, C36, C44, C50, C51, C65, C66, C72, C74, C80, C81	741566	Capacitor, .1µF/50V, Axial, Ceramic, +80/-20%
C18, C19, C68, C70	741570	Capacitor, .33µF/50V, Axial, Ceramic, ± 10%
C21, C22, C54, C64	736108	Capacitor, 10µF/16V, Radial, Electric, ± 20%
C23, C24, C28	741565	Capacitor, .1µF/50V, Axial, Ceramic, ± 20%
C25	736112	Capacitor, 1µF/50V, Radial, Electric, ± 20%
C29, C30, C89, C90	700365	Capacitor, 30pF/100V, Axial, Ceramic, ± 5%
C31	736102	Capacitor, 10µF/25V, Radial, Electric, ± 20%
C32, C53	736107	Capacitor, 1µF/6.3V, Radial, Electric, ± 20%
C33	700348	Capacitor, 1000pF/50V, Axial, Ceramic, ± 5%
C37	730024	Capacitor, 2200µF/50V, Radial, Electric, ± 20%
C40, C76	736115	Capacitor, 33µF/25V, Radial, Electric, ± 20%
C41	730042	Capacitor, 3300µF/25V, Radial, Electric, ± 20%
C42	730041	Capacitor, 4700µF/10V, Radial, Electric, ± 20%
C56, C79	700353	Capacitor, 10pF/100V, Axial, Ceramic, ± 5%
C57, C78	700360	Capacitor, 20pF/100V, Axial, Ceramic, ± 5%
C62, C63	736110	Capacitor, 22µF/50V, Radial, Electric, ± 20%
C75	749339	Capacitor, 22µF/10V, Radial, Tant, ± 20%
C77	724677	Capacitor, 22µF/15V, Axial, Tant, ± 20%
C84	741576	Capacitor, 270pF/100V, Axial, Ceramic, ± 5%
C88	741581	Capacitor, 200pF/100V, Axial, Ceramic, ± 5%
CR2-CR5, CR8, CR9, CR19-CR22, CR27, CR28, CR30, CR31	709100	Diode, Switch, 100V, 1N914
CR10, CR11, CR14, CR15	700521	Diode, Rectifier, 50V, 1N4001
CR12, CR13	722058	Diode, 1 Amp, Fast Recovery, 1N4933
CR16, CR17	782491	Diode, Ultra Fast Recovery, BYW98-50
CR18	734802	Bridge Rectifier, 4 Amp, 100V
CR29	760491	Transorb, 6.8V, P6KE6.8A
F1	793052	Pico Fuse, 3 Amp, Slo-Blo
F2	705294	Jumper Wire (60 Hz Machines)
F2	793051	Pico Fuse, .75A, Slo-Blo (50 Hz Machines)

CONTROL PC
BOARD COMPONENTS

P/N 792563—USA (5NEC, 5NCC, 5NDC, 5NWC, 5NEB, 5NCB, 5NDB)
P/N 792572—USA (5NEA, 5NCA, 5NDA)
P/N 792564—INTERNATIONAL



COMPONENT	PART NUMBER	DESCRIPTION
J2	723357	Header, Lock Post, 2 Position, .156
J3	770152	Connector, 18 Position Flat Cable, .100
L1	781560	Inductor, 270µH, 6A, 4 Pin
L2	760416	Inductor, 50µH, 3.3 Amp
L7, L8, W10, W11, W30, W44, W56-W58	705294	Jumper Wire
L16, L24	769391	Inductor, 5.6µH, Axial
L17, L20, L23	766462	Ferrite Bead
L18, L19, L21, L22	752314	Resistor, 0 Ω, 1/4W
LS1 (Beeper)	728783	Audio Transducer, 12V
Q1	783574	MOSFET, N-Channel, 60V, MTP3055
Q2, Q18	736600	Transistor, PNP, .2A, 2N3906
Q7-Q9, Q14, Q16, Q17, Q19	736601	Transistor, NPN, .4A, 2N3904
Q11	743086	Transistor, NPN, Darlington, 4A, 2N6039
Q12, Q13	591041	MOSFET, P-Channel, 50V, IRF9Z20
Q15	740344	Transistor, PNP, Darlington, 4A, 2N6035
R8, R67, R98-R100, R104, R141	701252	Resistor, 220 Ω, 1/4W, 5%
R12, R46	746938	Resistor, 390 Ω, 1/4W, 5%
R13, R14, R17, R19, R20, R82, R101, R121	701272	Resistor, 3.9 K Ω, 1/4W, 5%
R21, R26, R27	701280	Resistor, 1.8 K Ω, 1/4W, 5%
R22	749348	Resistor, 180 K Ω, 1/4W, 5%
R30, R31, R122	701299	Resistor, 8.2 K Ω, 1/4W, 5%
R32-R34, R36	748279	Resistor, 10 K Ω, 1/4W, 1%
R35	701271	Resistor, 470 Ω, 1/4W, 5%
R39	701255	Resistor, 2 K Ω, 1/4W, 5%
R40-R42	701254	Resistor, 1 K Ω, 1/4W, 5%
R43, R45	703734	Resistor, 820 Ω, 1/2W, 5%
R44	701286	Resistor, 820 Ω, 1/4W, 5%
R47	703733	Resistor, 390 Ω, 1/2W, 5%
R48	703730	Resistor, 3.9 K Ω, 1/2W, 5%
R53, R77, R78	701268	Resistor, 10 K Ω, 1/4W, 5%
R54, R55	701263	Resistor, 100 K Ω, 1/4W, 5%
R56	746192	Resistor, 4.7 K Ω, 1/4W, 1%

REF	PART NUMBER	PART NAME
R57	746191	Resistor, 12.1 K Ω, 1/4W, 1%
R58	701274	Resistor, 33 Ω, 1/4W, 5%
R59	724697	Resistor, 8.87 K Ω, 1/4W, 1%
R60	773130	Resistor, .1 Ω, 1W, 5%, Wire Wound
R61	781720	Resistor, 11 Ω, 1/4W, 5%, Wire Wound
R75, R76, R83, R90, R91, R97, R133, R142-R144, R146	701279	Resistor, 3 K Ω, 1/4W, 5%
R92-R95, R145	701284	Resistor, 330 Ω, 1/4W, 5%
R102, R123-R130	701275	Resistor, 22 K Ω, 1/4W, 5%
R105, R106	748244	Resistor, 68 Ω, 1/4W, 5%
R107, R111, R112, R114-R120	771004	Resistor, 120 Ω, 1/8W, 5%
R108, R109	771006	Resistor, 180 Ω, 1/8W, 5%
R110	771005	Resistor, 100 Ω, 1/8W, 5%
R138-R140	748225	Resistor, 11 Ω, 1/4W, 5%
R147	701297	Resistor, 5.6 K Ω, 1/4W, 5%
R148-R163, R168-R175	771002	Resistor, 0 Ω, 1/8W
R164-R167, R176-R184	771003	Resistor, 75 Ω, 1/8W, 5%
R185	746190	Resistor, 1M Ω, 1/4W, 5%
SC1	781910	Mounting Screw
SP1-SP14, SP25-SP50, SP59-SP94, SP101, SP102	748858	Stake Pin, .025 Square
U6	910658	IC, HCMOS Inverter, 74HC04
U8	790431	ASIC, New ARC LCD
U9	724700	IC, Hex Inverter, Open Collector, 7406
U10-U12	781722	IC, Quad Driver w/Inverters, L6220
U13	786855	IC, Microprocessor, Slave, 8052
U14	701451	IC, Quad Comparator, LM339
U15, U31	766377	IC, CMOS Dual D-Flip Flop, 74HC74
U16	769431	IC, 16 Bit Processor, MC68000
U20	760754	IC, Dual Decoder w/Open Collector, 74LS156
U22, U28-U30	760511	IC, 64 K x 4, DRAM 41464
U25	786726	IC, 2 Meg ROM, USA, 5NEB, 5NCB, 5NDB, 5NEC, 5NCC, 5NDC, 5NWC
U25	786727	IC, 2 Meg ROM, USA, 5NEA, 5NCA, 5NDA
U26	786741	IC, Dictionary ROM, USA
U27	786856	IC, 2 Meg ROM, USA, 5NEB, 5NCB, 5NDB, 5NEC, 5NCC, 5NDC, 5NWC
U27	786858	IC, 2 Meg ROM, USA, 5NEA, 5NCA, 5NDA
U32	751442	IC, CMOS Quad 2 Input AND Gate, 74HC08
U33	769360	IC, Floppy Disk Controller, MCS3201
VI1	725119	Vinyl Insulator
VR1	781740	Diode, Zener, 5.1V, 1.5W, 1N5918
VR4, VR9	765829	Diode, Zener, 2.4V, .5W, 10%, 1N5221
VR6	766378	Diode, Zener, 5.1V, 1/2W, 2%, 1N5993C
VR7	724682	Diode, Zener, 24V, 1/2W, 5%, 1N5252
VR8	769448	Diode, Zener, 12V, 1/2W, 5%, 1N5242B, 5NEC, 5NDC, 5NWC
VR8	791024	Diode, Zener, 13V, 1/2W, 5%, 1N5243B, 5NEB, 5NCB, 5NDB, 5NEC
VR8	769410	Diode, Zener, 14V, 1/2W, 5%, 1N5244B, 5NEA, 5NCA, 5NDA
WS1	781628	Insulation Bushing
Y1	736950	Resonator, Ceramic, 12MHz
Y3	769365	Crystal, Quartz, 36MHz
Y4	769366	Crystal, Quartz, 24MHz
International		
U25	786731	IC, 2 Meg ROM, United Kingdom, Australia, 5NEA
U25	786732	IC, 2 Meg ROM, Spanish/American, Chile, 5NEA
U25	786762	IC, 2 Meg ROM, Canada, 5NEA, 5NEB, 5NEC
U26	786742	IC, Dictionary ROM, Canada, 5NEA, 5NEB, 5NEC
U26	786743	IC, Dictionary ROM, Spanish/American, Chile, 5NEA
U26	786744	IC, Dictionary ROM, United Kingdom, Australia, 5NEA
U27	786780	IC, 2 Meg ROM, Canada, 5NEA, 5NEB, 5NEC
U27	786860	IC, 2 Meg ROM, United Kingdom, Australia, 5NEA
U27	786861	IC, 2 Meg ROM, Spanish/American, Chile, 5NEA

102271	9	730024	15	749789	11	770183	12	772118	2
105090	8	730041	15	749841	9	770189	9	772920	11
105100	12	730042	15	749965	8	770199	12	773130	17
133250	6	734802	15	750056	12	770277	9	774465	2
365319	6	736102	15	750075	12	770280	11	774466	2
365319	9	736107	15	751437	12	770288	10	774473	2
365319	11	736108	15	751442	17	770290	9	774502	11
428090	9	736110	15	751719	7	770291	10	774871	8
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